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ABSTRACT

This report provides a review of higher education systems in selected developed countries and compares higher education in the United States and other countries. The report draws on data from the Indicators of National Education Systems Project of the Centre for Educational Research and Innovation (CERI) of the Organisation for Economic Co-operation and Development (OECD), the OECD journal "Higher Education Management," and three "encyclopedias" of education information. The first chapter provides a historical background, discusses more recent trends, and describes the resulting governance structures of higher education systems, focusing on 12 developed countries. Chapters 2, 3, and 4, discussing student participation, resources and expenditures, and education outcomes respectively, contain a variety of measures that are often found as measures of the inputs and outputs of education systems. These chapters allow the comparison of national education systems in a number of areas. Chapter 5 focuses on the research function of higher education. Three appendixes contain basic reference tables, detailed tables, and technical notes. (Contains 18 tables, 71 figures, and 87 references.) (SLD)

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An International Perspective

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Higher Education:
An International Perspective

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INTRODUCTION

INTRODUCTION

Higher education is a very important component of most countries' education systems. In most developed countries, over a third of young adults in the typical higher education age range are students. Modern societies now demand large numbers of graduates with knowledge and skills typically developed in higher education institutions, and they compensate those graduates more than in the past for the acquisition of those skills. Indeed, in the most developed countries, higher education has replaced secondary education as the focal point of access to rewarding careers. What has been said of U.S. job seekers is also true for those in most other developed countries: given current technologies in transportation, communication, and trade, if a worker's skills are no better than those of poorly educated, low-paid workers in less-developed countries, that worker is likely to face tough economic pressure.

The purpose of this report is to provide a review of higher education systems in selected developed countries and to compare higher education in the United States and other countries.

Our "focus group" of countries

This report will not be useful if the comparisons across countries are not valid, however. The most basic assumption justifying this effort proposes that observing the country variation in educational indicators can be instructive -- instructive by placing our own system in the context of others and instructive in benchmarking the "best practices" of other countries to ours.

Ideally, country-level comparisons are most useful among like or competitive countries. Unfortunately for this comparison, there is really no other country quite like the United States on dimensions such as geographical size, population, wealth, and governance structure. We therefore chose 11 other countries which share some similarities with the United States for comparison. This group comprises many of our primary economic competitors, including the other Group of Seven (G-7) countries – Canada, France, Germany, Italy, Japan, the United Kingdom – which represent the world's seven largest economies.

We chose also to include Australia and the Russian Federation because they are both geographically large countries with federal governance structures. Each also has maintained a large, well-developed higher education system for several decades. Switzerland also is a wealthy country with a federal governance structure. Sweden, though only geographically large by European standards and only recently making efforts to decentralize its higher education system is also relatively wealthy and has often served as a trend-setter in education and social policy. Our final addition to the focus group is Spain, another large European country that has been decentralizing control over education from the national government to regional authorities. Our focus group of twelve countries, along with their salient characteristics, is listed in the table below.

Table 1-1: Focus group of countries and their salient characteristics

Country	Geographic size[a]	Population size[b]	GDP per capita[c]	Federal system
Australia	large	small	large	yes
Canada	large	small	large	yes
France	medium	medium	large	no
Germany	medium	medium	large	yes
Japan	medium	large	large	no
Italy	medium	medium	large	no
Russia	large	large	small	yes
Spain	medium	medium	medium	no
Sweden	medium	small	large	no
Switzerland	small	small	large	yes
United Kingdom	medium	medium	large	no
United States	large	large	large	yes

[a] Small: less than 25, 000 square miles; medium: 25,001 to 75,000; large: greater than 75,000.
[b] Small: less than 30 million persons; medium: 30 million to 100 million; large: greater than 100 million.
[c] Small: less than $10,000 annually; medium: $10,001 to $15,000; large: greater than $15,000.

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Structure of this report

This report is intended to break from the tradition of education indicator reports that bear the appearance and organization of reference books. Data tables are provided in appendices. Notes are provided in appendices, too. Graphs are embedded in the text immediately after the point at which they are referenced and only included if they help tell the story.

This report has five chapters, in addition to this introduction, and three appendices: basic reference tables; detailed tables; and technical notes.

The first chapter, Chapter 1, provides the historical background, discusses more recent trends, and describes the resulting governance structures of higher education systems. Because of different historical legacies, secondary education systems, demographic patterns, economic demands, and other factors, higher education systems can differ quite dramatically in structure across countries. These background differences need be at least roughly gauged before current country-to-country comparisons can be understood.

Chapters 2, 3, and 4 -- student participation, resources and expenditures, and education outcomes -- contain a variety of measures that are often found in education indicators reports, measures of the "inputs" and "outputs" of education systems. The participation chapter (Chapter 2) compares countries' levels of participation in higher education across countries, patterns in participation across ages, and the patterns and relative difficulty of entry to higher education.

The resources and expenditures chapter (Chapter 3) compares countries' allocation of education expenditure by sources of funds and final spending, per-student or per-GDP expenditures, and the levels of staffing.

The outcomes chapter (Chapter 4) compares countries' completion ratios, patterns of completion across fields of study, labor market outcomes (earnings levels, unemployment rates, and labor force participation rates) by level of educational attainment, literacy levels by level of educational attainment, and the intergenerational legacy in children's mathematics and science achievement and levels of educational attainment by their parents' level of educational attainment.

Chapter 5 focuses on the research function of higher education. In part by tradition, in part by design, basic and applied research are an integral part of most universities' missions and of some non-university higher education institutions.

Sources of data

This report draws on data from five main sources. The main data source is the Indicators of National Education Systems (INES) Project of the Centre for Educational Research and Innovation (CERI), of the Organisation for Economic Co-operation and Development (OECD). Since 1992, the OECD, an organization representing 29 wealthy industrialized nations, has published education indicators in a series of reports called ***Education at a Glance*** (EAG). This report incorporates data from the fifth in the EAG series. It includes data mostly from the 1994-95 academic year or, in the case of finance indicators, from the 1994 calendar year.

A second important source of information and data on higher education is OECD's journal ***Higher Education Management***. Most of the information on the long-term trends, governance, and structure of higher education systems derive from this journal series.

Other sources include:

- the Third International Mathematics and Science Study (TIMSS), conducted in 1994-95, which provides an indicator on the intergenerational legacy of educational attainment through its correlation with children's math and science achievement;
- the International Adult Literacy Study (IALS), conducted in 1994 and 1996, which provides two indicators: one on the intergenerational legacy of educational attainment on children's level of educational attainment; and another on the correlation between higher levels of literacy and level of educational attainment among adults; and

- the OECD's R&D database, which provides data on research and development expenditures in higher education.

In addition, we have consulted three very informative "encyclopedias" -- ***International Higher Education: An Encyclopedia***, edited by P.G. Altbach, the ***Handbook of World Education,*** edited by W. Wickremasinghe, and the ***International Encyclopedia of National Systems of Education,*** edited by T.N. Postlethwaite.

The structure of higher education systems

What is "higher education?"

What criteria do we use to classify programs as part of higher education? First, we include only educational programs that require, in principle, the completion of an upper secondary degree (a high school degree in the United States) for entry. That stipulation does not, however, necessarily equalize the level of skill or acquired knowledge at the point of entry to higher education across countries, as we shall see in Chapter 2 of this report. The skill level associated with secondary schooling completion may vary significantly from country to country.

Second, we include only formal education in degree-granting programs. This restriction excludes both recreational adult education and vocational/technical programs of less than 2 years duration that lead only to specialized vocational-technical certificates.

How is "higher education" defined internationally?

The definition of "higher education" lacks perfect consistency across countries, essentially because countries offer similar programs of study at different types of institutions and at different stages of students' academic careers. For example, a course of study ordinarily considered to be "higher education" in the United States (nursing for example) may be classified as secondary education in another country, such as Germany. Similarly, degree programs may be of different durations. In contrast to the standard in the United States, some countries typically offer "long" first-university (i.e., bachelor's) degree programs that require 6, rather than 4, years of study, after which a student may directly enter a Ph.D. program; no master's level programs intervene between the bachelor's program and the Ph.D.

To make comparisons as valid as possible, the International Standard Classification of Education (ISCED) System, originally developed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), was used as the framework for comparison. Table 1.2 presents a summary of the higher-education-relevant portion of the ISCED classification in use up to 1997. Based on this pre-1998 ISCED classification, we will include in this study all programs classified as "non-university tertiary education" (ISCED5), "university education" (ISCED6), and "graduate and professional education" (ISCED7).

Table 1.2: The International Standard Classification of Education (ISCED) System for levels 3 (upper secondary education) and above*
Level 3: Upper secondary education begins at about age 14 or 15, and lasts about 3 years. For the United States, the third level starts with grade 10 and ends with grade 12.
Level 5: Non-university higher education is provided at community colleges, vocational-technical colleges, and other degree-granting institutes whose programs typically take 2 years or more, but less than 4 years, to complete.
Level 6: University higher education is provided in undergraduate programs at 4-year colleges and universities in the United States, and, generally, at universities in other countries. Completion of education at the third level (upper secondary education) is usually required as a minimum condition of admission—and admission is, in many cases, competitive.
Level 7: Graduate and professional higher education is provided in graduate and professional

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schools that generally require a university diploma as a minimum condition for admission.

* No ISCED level 4 exists.

It may seem reasonable to assume that educational activities are ordered to form pathways for individuals through an education system and following that path represents an ordered increase in educational attainment. Educational programs, however, are often ordered only to a limited extent, and individuals can choose to arrange their educational pathways in many different ways. To respond, education systems provide multiple branching paths, alternative program sequences, and "second-chance" provisions. Most countries also have witnessed an increase in "horizontal" movements through education systems in which a participant can broaden his or her education with only a partial increase in the "level" of education.

It thus becomes sometimes difficult to attribute a program to a particular level of education. A taxonomy that is *program-based* necessarily loses part of the information on the *pathway* of the participants through the education system. Any strict hierarchy of educational programs can thus reflect the reality of education systems only to a limited extent.

Probably the most vexing problem in maintaining the ISCED standard has occurred at the level of transition between upper secondary education and higher education. Some countries classify programs as "upper secondary" that other countries classify as "higher education," and *vice versa*. That causes some statistical comparability problems, as we shall see later in this report. Vocational-technical programs fall most frequently into this nether land between "higher" and "lower" education.[1]

Professional training also suffers from classification anomalies across countries. Many would agree that medical training should be classified as a "university" level program (though it is not in a few of our focus group countries).[2] However, there is no clear line of demarcation across countries for nursing programs, teacher-training programs, schools of pharmacy or podiatry, or similar programs. In the United States, for example, "registered nurses" follow courses in "university" level institutions, while "licensed practical nurses" generally follow courses in "non-university" level institutions. In some other countries, however, nurses attend "non-university" higher education or upper secondary level programs. In France, for example, all nurse training can be found in non-university higher education level programs. The program focuses solely on nurse training (i.e., there are no "distribution" course requirements) and lasts 33 months. Places in the program are obtained through competitive examinations open to lycée (i.e., high school) graduates.

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[1] UNESCO and OECD plan to introduce a new ISCED level "4" that can accommodate these programs that do not fit comfortably into either the upper secondary (level 3) or higher education (levels 5–7) levels.

In contrast, nurse training in Germany may be either an upper secondary (i.e., high school) level or non-university higher education level program. Programs typically last three years, and entering students must be at least 17 years old. While similar to the French program, the German program differs in that an upper secondary level degree is not required for entry, as it is in France.[3]

Consideration of these comparability issues is especially pertinent when comparing programs between the United States and countries such as Germany, Sweden, and Switzerland, which operate "dual systems" that incorporate apprenticeships for the skilled trades and many professions right into their education systems. Countries with these dual systems seem to have relatively low rates of enrollment in higher education and relatively high rates of enrollment in upper secondary education programs for students over 18 years old and into their twenties. The nursing program example above illustrates the primary explanation for the disparity.[4] The ISCED classification of a U.S. nursing program at a community college (ISCED Level 5) and a nursing program in a German "secondary school" (ISCED Level 3) suggests far more difference between the programs than actually exists.[5]

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[2] Even at the university and graduate school levels of education there exist some differences in how countries match programs to levels. In the United States, those aspiring to be doctors or dentists must, with uncommon exceptions, possess a 4-year university degree before entry. Then, they earn a second degree in their occupational specialty. In many other countries, certificates to practice medicine or dentistry are earned directly as first university degrees.

[3] U.S. Education Department, ***Education Indicators: An International Perspective***, pp. 38–39.

How do institutions and programs of study compare across countries at the "non-university" higher education level?

The non-university higher education level (ISCED5) describes schools and programs of 2 years' duration or longer, but less than 4 years' duration. For the United States, this excludes most "proprietary trade schools" that focus exclusively on a single trade and skill and award certificates for the mastery of the single trade or skill, but do not offer higher education degrees that attest to mastery of a curriculum of greater breadth. The non-university higher education level also excludes "university level" programs that typically require 4 years or more of full-time study.

The table below illustrates what the countries in our focus group count as non-university higher education institutions and programs. The United States, Japan, and most of Canada are exceptional in that programs with a very general curriculum – those at junior or community colleges offering associate's degrees – typify the institutions classified as non-university higher education. For the rest of Canada and the other countries in our focus group, one is more likely to find vocational-technical institutes, schools of art and design, health sciences schools, and teacher training colleges at the non-university higher education level.

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[4] For more information on the contrast in apprenticeship programs between the United States and the dual system countries, see the Technical Notes in Appendix C.

[5] U.S. Education Department, ***Education Indicators: An International Perspective***, pp. 38–39.

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Table 1.3: Types of higher education institutions and their programs of study at the non-university higher education level (ISCED 5), by country: 1995

Type of institution	Fields of study (if specific to degree)	Degree or qualification	Entry requirements	Typical duration (in years)	Typical entry age
AUSTRALIA					
Technical and Further Education (TAFE) colleges, centers	vocational education and training; adult education	advanced certificate (IV), diplomas, advanced diplomas	Higher school-leaving certificate	<1yr to 2 yrs	19
CANADA					
community colleges	all	diplomas or certificates	secondary school diploma	2 years	18
colleges d'enseignement general et professionnel –Quebec	pre-university program	diplomas or certificates	secondary school diploma	2 years	17
vocational-technical institutes	vocational education and training; adult education	diplomas or certificates	secondary school diploma	1 to 3 yrs	18
FRANCE					
Institute universitaire de technologie (IUT)	vocational education and training	diplome universitaire de technologie (DUT)	baccalaureate (high school diploma)	2 to 3 yrs	18 – 19
Sections de techniciens superieurs (STS)	advanced or highly specialized vocational education and training	brevet de technicien superieur (BTS)	baccalaureate (high school diploma)	2 to 3 yrs	18 – 19
GERMANY					
Fachschulen	vocational education and training	Meister, techniker, or other vocational certificate	Successful completion of Berufsschulen (vocational upper secondary school in dual system)	1 to 4 yrs	19
Schulen des gesundheirswesens	health sciences, non-academic medical training	Meister, techniker, or other vocational certificate	Lower secondary school diploma or related vocational experience, and minimum age of 18	1 to 3 yrs	19
ITALY					
Accademia di belle arti	art and design schools	Licenza	Maturita (high school diploma)	4 yrs	19
JAPAN					
Tanki-Daigaku (junior colleges)	all	Jungakushi (associate degree)	high school diploma	2 to 3 yrs	18
KotoSenmon-Gakko (vocational-technical colleges)	vocational education and training	Jungakushi (associate degree)	high school diploma	2 to 3 yrs	18
RUSSIA					
N/A					
SPAIN					
Institutos de educacion secundaria	Formacion profesional de grado medio/superior (intermediate, advanced vocational or art & design education	Technico superior	bachilierato (high school diploma)	2 years	18
SWEDEN					
Grundlaggande Hogskoleutbilding (university) (some programs)	vocational education and training	Hogskoleexamen (diploma)	12 year secondary-school-leaving certificate, or 15 years of age with 4 years professional experience and good reading knowledge of English	2 years	19
SWITZERLAND					
Ecoles techniques superieures at autres ecoles superieures	vocational-technical programs and general studies	diplome	diplome (certificate) or baccalaureate (high school diploma)	4 years	20
Cours preparatoires aux examens professionels superieurs	preparatory schools for entry examinations to advanced professional programs	brevet federal, diplome	diplome (certificate) or baccalaureate (high school diploma)	4 years	20
Formation des enseignants	teacher colleges	diplome	diplome (certificate) or baccalaureate (high school diploma)	3 to 5 yrs	20
UNITED KINGDOM	**England & Wales**				
further education sector colleges	vocational education and training	"sub-degree": higher national certificate; national diploma or vocational qualification, level 4	"O levels" – successful passage of GCSE (lower secondary level diploma)	2 years	18
colleges of higher education	all (traditionally teacher colleges)	certificate	"A levels" – successful passage of GCE, advanced GNVQ, or NVQ3 (upper secondary level diploma or vocational certificate)	2 years	18
UNITED STATES					
community or junior college	all	associate degree	high school diploma	2 years	18
vocational-technical institutes	vocational education and training	diplomas or certificates	high school diploma	2 to 3 yrs	18

* Two components: general education(humanities, social sciences, applied or natural sciences and fine arts) and an area of specialization or major.

** Duration varies by field and institution

***If a master's degree is not required, then duration of program is longer

SOURCE: Organisation for Economic Co-operation and Development, Indicators of Education Systems Project, ***Education at a Glance, 1995, 1997***, Paris; Altbach, P.G., Ed. ***International Higher Education: An Encyclopedia***. New York: Garland Publishing, 1991; Wickremasinghe, W. Ed. ***Handbook of World Education***. Houston: American Collegiate Service, 1992. Postlethwaite, T.N. Ed. ***International Encycopedia of National Systems of Education***. New York: Pergamon, 1995.

How do programs of study compare across countries at the "university" higher education level?

The university higher education level (ISCED 6) describes undergraduate programs at 4-year colleges and universities in the United States and, generally, at universities in other countries. Completion of education at the third level (upper secondary education [high school in the United States]) is usually required as a minimum condition of admission, and admission is, in many cases, competitive. University level programs typically require 4 years of full-time study in countries with "short" first university degree programs, and 5 or 6 years of full-time study in countries with "long" first university degree programs..

The graduate and professional higher education level (ISCED7) programs generally require a university diploma as a minimum condition for admission. In most countries, these programs are offered at universities.

The table below describes what countries in our focus group count as university-level and graduate and professional higher education institutions and programs. Universities, not surprisingly, fit into this category for every country in our focus group. Some countries also include "polytechnics" (vocational-technical institutes that require advanced academic achievement both for admission and completion). The U.S. version of a "polytechnic" is an engineering school offering bachelor's degrees.

Table 1.4: Types of higher education institutions and their programs of study at the university level (ISCED 6,7), by country: 1995

AUSTRALIA						
Universities	all	Bachelor's	Higher school certificate, university entrance examination, school- leaving certificate	3 to 7**	19	first
Universities	all	Master's, Post-graduate diplomas, or Doctor's degree	Bachelor's degree	1 to 4	23	second, third
CANADA						
Universities	all	Bachelor's and first-professional degrees	Secondary school diploma (12- 13 years depending on province)	3 to 4	18	first
Universities	all	Master's, first-professional degree, or Doctor's degree	Bachelor's	1 to 4***	22	second, third
FRANCE						
Universites	all	Diplome d'etudes (DEUG, DUEST, DEUP), Licence, Maitrise	Baccalaureat or equivalent	2 to 5	18	first
Universites	all	Diplome d'etudes universitaires generales (DUEG)	Baccalaureat or equivalent	2	18	first
Universites	all	Maitrise, Doctorat	Diplome	1 to 7	22	second, third
Universites - Sante	health sciences	License	DEUG or DUT	1	18	first
Universites - Sante	health sciences	Maitrise	License	1	20	second
Ecoles Specialisees	Architecture, engineering, pharmacy, political studies	Diplome ecoles superieures specialisees (DESS) (Award often serves as a professional qualification.)	Baccalaureat or equivalent; maitrise	5	18	first, second
Grandes Ecoles		Diplome (of school of particular subject) (Award often serves as a professional qualification.)	Baccalaureat or equivalent, entrance examination after 1 to 3 years of post-baccalaureat preparatory classes	3	20	first
GERMANY						
Universitaten	all	Diplom (university) & similar degrees (Magister, Staatsprufung, Kunstlerischer Abschluss, Kirchlicher Abschluss); Lehramtsprufung (Teacher qualification, degree for teachers)	Hockschulreife (completion of academic secondary school), and passage of Abitur, secondary school leaving examination, and individual university entrance examinations	6	19	first
Universitaten	graduate-level studies	Doctorprufeungen	Diplom (university) & similar degrees	2	28	second
Fachochschulen	vocational and professional courses	Diplom (Fachhochschulen)	Hockschulreife (completion of academic secondary school), and passage of Abitur, secondary school leaving examination	4	19	first
ITALY						
Universita ed istituti universitari (universities)	all general, technical, and professional courses, including medicine	Diploma di Laurea	Maturita	4 to 6	19	first
Universita ed istituti universitari (universities)	graduate-level courses	Diploma di Laurea; Dottorato di ricerca	Laurea; Maturita	4 to 6	25	second
Universita ed istituti universitari (universities)	corsi di diploma universitario (short university courses)	Diploma universatario (Laurea breve)	Maturita	2 to 3	19	first
Scuole dirette a fini speciali	vocational and professional courses	Diploma di specialista	Maturita	2 to 3	19	first
JAPAN						
Daigaku (universities)	all, including medicine, veterinary medicine, and dentistry	Gakushi (Bachelor)	Upper secondary completion, standardized national examination, and university entrance examination	4 to 6	18	first
Daigaku (universities)	all, including medicine, veterinary medicine, and dentistry	Shushi (Master); Hakushi (Doctor)	Gakushi (Bachelor); Shushi (Master)	2 to 5	27	second, third
RUSSIA						
Universities	general (humanities, and natural sciences) as well as professional courses	Bachelor's degree	11 years of secondary school or 12 years of secondary-professional education	4	17 or 20	first
Universities	graduate-level general courses as well as professional courses	Master's degree; Kanditat nauk; Doktor nauk	Bachelor's degree; Intematura	1 to 6	22 or 25	second, third
Polytechnics	General (humanities, and natural sciences) as well as professional courses and medical specialties	Specialist's certificate; Intematura	11 years of secondary school or 12 years of secondary-professional education	4	17 or 20	first

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Table 1.4: Types of higher education institutions and their programs of study at the university level (ISCED 6,7), by country: 1995 (continued)

SPAIN						
Facultades Universitarias (university)	all	Licenciado, Primer ciclo de Lecenciatura, Ingeniena y architectura (Orientacion academia)	Bachillerato and Curso de Orientacion Universitaria (high school diploma and 1 year university preparatory courses)	5 to 6	25	first
Facultades Universitarias (university)	graduate-level programs	Doctor, ingeniero, arquitecto, post grado y master	Primer ciclo de Lecenciatura, Ingeniena y architectura (Orientacion academia. Proporciana una certificacion que iene un reconcimiento profesional equivalente al diplomado, en los concursos del admon publica.)	2	30 or 31	second
Escuelas Universitarias (university college)	all; architecture, engineering	Diplomado (Orientacion profesional); Arquitectos technico, ingenieros technico (Orientacion profesional)	Bachillerato or Formacion Profesional	3	25	first
Escuelas Superiores, Escuelas Tecnicas Superiores	ingenena, arquitectura, medicina, other professional fields	Primer Ciclo de Arquitectura; Primer Ciclo de Ingenena; Primer Ciclo de Medicina	Bachillerato and Curso de Orientacion Universitaria (high school diploma and 1 year university preparatory courses)	5 or 6	25	first
Escuelas Superiores; Escuelas Tecnicas Superiores	graduate-level programs in technical and professional fields	Licenciado e Ingeniero, Arquitecto, Medicina, Farmacia, Quimica, Biologia, Psicologia	Primer Ciclo de Arquitectura; Primer Ciclo de Ingenena; Primer Ciclo de Medicina	2	30 or 31	second
Escuelas Superiores; Escuelas Tecnicas Superiores	graduate-level programs in technical and professional fields	Especialidades Sanitarias	Lienciado Medicina, Farmacia, Quimica, Biologia, Psicologia	3 or 4	32 or 33	third
SWEDEN						
Grundlaggande Hogskoleutbilding (universities)	all	Hogskoleexamen (diploma); Kandidatexamen (bachelor's degree); Magisterexamen (master's degree); Yrkesexamen (professional degrees)	13 years, secondary-school leaving certificate or be 25 years of age and have 4 years of professional experience and a good reading knowledge of English	1 to 5.5		first, second
Forskarutbilding	graduate and professional schools	Licenciatexamen; Doktorsexamen	Degree of at least 3 years duration	2 to 4		second
SWITZERLAND						
Universites	all	Lizentiat Universitat/Staatsexamen (medezin)/Diplom Hochschule// License Universite/Diplome federal (medcine)	13 years, maturite: entrance examination	4 to 7	20	first
Universites	etudes postgrades (graduate programs)	Doktorat// Doctorat	License Universite, Diplome Haute Ecole, Diplome federal (medecine)	3 a 4	31	second
Hautes Ecoles	professional programs	Diplom Fachschulen//Diplome Haute ecole specialisee	13 years of education, maturite professionnelle ou maturite + stage professionnel	1 a 5	20	first
UNITED KINGDOM						
Universities	all	Bachelor's degree	13 years, general certificate of education	3	18	first
Universities	all, graduate programs	Master's, first-professional degree, or doctor's degree	Bachelor's degree	1 to 3	21	second, third
Polytechnics	all, particularly those more vocationally oriented	Bachelor's degree or professional qualifications in various fields	13 years, general certificate of education	3 to 4	18	first
Colleges of Higher Education	all (traditionally teachers' colleges)	Bachelor's degree or professional qualifications in various fields	13 years, general certificate of education	2 to 4	18	first
UNITED KINGDOM						
Universities	all	Bachelor's degree				first
Universities	all, graduate programs	Master's, first-professional degree, or doctor's degree	Bachelor's degree			second, third
Colleges of Higher Education	all (traditionally teachers' colleges)	Bachelor's degree				first
UNITED STATES						
Universities	all	Bachelor of arts (B.A.) or Bachelor of science (B.S.) degree*	12 years, high school diploma or equivalent, standardized examination	4	18	first
Universities	all	Master's, first-professional degree, or doctor's degree	Bachelor's degree	1 to 4	22	second, third
4-year colleges	all	Bachelor of arts (B.A.) or Bachelor of science (B.S.) degree*	12 years, high school diploma or equivalent	4	18	first

* Two components: general education (humanities, social sciences, applied or natural sciences and fine arts) and an area of specialization or major.

** Duration varies by field and institution

***If a master's degree is not required, then duration of program is longer

SOURCE: Organisation for Economic Co-operation and Development, Indicators of Education Systems Project, Education at a Glance, 1995, 1997, Paris; Altbach, P.G., Ed. *International Higher Education: An Encyclopedia. New York: Garland Publishing, 1991; Wickremasinghe, W. Ed. Handbook of World Education. Houston:* American Collegiate Service, 1992. Postlethwaite, T.N. Ed. International Encycopedia of National Systems of Education. New York: Pergamon, 1995.

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Countries also differ in the degree to which they separate institutions by curricular focus. At one extreme, again, are Japan, Canada, and, perhaps, the United States, where all programs of study can be found under the "umbrella" of a university. At the other extreme are France and Spain, where institutions tend to specialize by curricular or professional theme.

In summary, higher education systems vary considerably from country to country, making strict comparisons among them imperfect. Nonetheless, considerable effort has been focused on making the statistics collected by international organizations as comparable as possible. In this publication, we borrow UNESCO's ISCED system as an organizing framework, appreciative of its strengths even while we are aware of its limitations.

CHAPTER 1

HISTORICAL BACKGROUND, RECENT TRENDS, AND CURRENT GOVERNANCE IN HIGHER EDUCATION SYSTEMS

CHAPTER 1

HISTORICAL BACKGROUND, RECENT TRENDS, AND CURRENT GOVERNANCE IN HIGHER EDUCATION SYSTEMS

One cannot fully understand modern-day higher education institutions without knowing their history. The world's oldest universities are among the oldest continuously administered institutions on earth, older than any current governments, older than any modern corporation. Some church denominations are older, but not much else.

This chapter focuses on the historical legacy of universities dating back to medieval times. This legacy explains some of the more salient characteristics of universities today, including why universities are organized and governed so differently from other modern-day large organizations, such as corporations and governments. The chapter continues by examining more recent trends in higher education: huge growth, institutional diversification, and a convergence of higher education system characteristics across countries.

Historical background

The oldest university on earth, the University of Bologna, is now over 900 years old. Universities at Paris, Oxford, and Salerno are only slightly younger, legacies of the High Middle Ages and antecedents to the western world's Renaissance.[6] (See Figure I.1) Yet, one-third of the universities in Europe today either did not exist just 30 years ago, or they did not exist as universities.[7] This combination of aged tradition and recent, rapid growth frames the picture of higher education in

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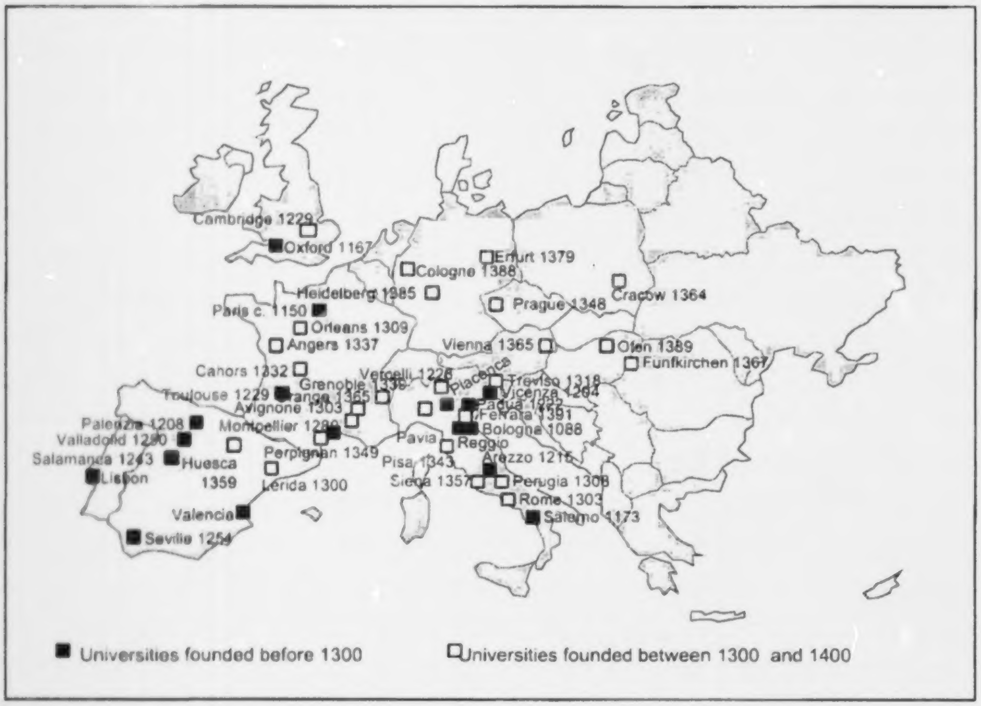
[6] ***Anchor Atlas of World History***, pp. 180–181.

Europe today.

Figure 1.1: Universities in Europe, by founding date: 14th century



SOURCE: ***The Anchor Atlas of World History, Volume 1***, p. 180.

Legacies of the medieval origins of European universities still remain. The names of the diplomas awarded then — *baccalaureus, licentiat, magister* — sound much the same as those awarded now.[8] A Bologna student *circa* 1100 transported in time to a university of today, however, might recognize little else. The scale of the enterprise would probably present the most remarkable contrast. At the beginning of the millennium, universities formed from small groups of learned monks

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[7] Neave, pp. 15–16.

[8] ***Anchor Atlas***, pp. 180–181.

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and itinerant members of the small leisure class of the period, such as disinherited second sons of the nobility. They gathered inside cathedral ante-chambers or monasteries for Socratic discussions, in Latin, of law, religion, and philosophy. Today, higher education institutions host half of the young adult population in France, Germany, and Sweden and over 40 percent of it in Italy and Spain. Perhaps even more remarkable, higher education enrollment has *doubled in just the past twen[illegible]ars* in most of Europe.[9] As for the programs of study that higher education institutions now offer, they are many.

Evolution of the university in Europe[10]

Medieval Europe spawned two university governance models. In the Italian, or "student university" model, started at Bologna, students organized themselves into student guilds with legal status and protections. They imposed discipline on their teachers, whom they paid, hired, and fired at will. This model of governance prevailed in Europe south of the Alps for a few centuries in the early part of the second millennium. Gradually, and perhaps inevitably, it converged toward the more lasting model to be found in Europe north of the Alps.

The University of Paris set that model, and much of its institutional and curricular structures are still prevalent today. The monk Abelard, author of ***Sic et Non*** (Pro and Con, Thesis and Antithesis) popularized the dialectic method that he used in an attempt to reconcile Christian and classical texts. Other philosopher-monks, such as Albertus Magnus (De ***Unitate Intellectus***, On the Unity of the Intellect) and Thomas Aquinas (***Summa Theologica***, Encyclopedia of Theology), continued the tradition at Paris.

There were dangers involved in questioning the orthodox beliefs of local prelates, however, and "town-gown" rivalries sometimes fostered riot, imprisonment, and death. Some kings and popes both, however, saw value for the state and Western society in higher learning and sought to protect it. State and papal protections were conferred on the University of Paris as early as the 12th century. With its "corporate" form established by charter, the university began to grant degrees, or licenses, just as the craft guilds did: undergraduates were apprentices, bachelors were journeymen who could practice a trade, and masters were those who could teach it.

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[9] OECD, ***Alternatives to Universities,*** Table 1.A.

[10] This section borrows heavily from Harold Perkins' excellent "History of Universities."

Paris also developed the college, a residence where older students tutored newer ones. The chaplain to Saint Louis (the crusader King Louis IX), Jean de Sorbon, endowed one of the first, the "House of Sorbonne" in 1257. Much as the craft guild served as model for university operations, the monastery served as model for the college.

Though products of Medieval society, universities promoted questioning and skepticism and so represented a threat to Roman Catholic orthodoxy and the entrenched power of its clergy. Universities manifested a third "intellectual estate" alongside church and state in the order of society. The Protestant Reformation needed only to borrow the intellectual methods of the university and apply them to a study of the Church and church doctrine.

For a long time after the Reformation and the age of religious wars, however, European universities changed little of their curriculum or their organizational structure. The Industrial Revolution in the 19th century erupted without and outside the universities. Indeed, entirely new institutions, such as mechanics' institutes in Great Britain, *technische hochschulen* in Germany, and *grandes écoles* in France, eventually were formed to teach industrial methods.

University professors had always combined research with teaching, but research in the classical university consisted largely of the conservation of traditional knowledge. Small universities in 18th- and 19th-century Scotland and Germany, however, transformed the research role of professors into that of creators of new knowledge. The post-Napoleonic German state granted its professors virtually absolute freedom to teach and conduct research. In return, they produced an abundance of new knowledge in both the sciences and the humanities through the 19th and 20th centuries. The German model has prevailed ever since in Northern Europe and North America.

The modern French model, instituted after the Revolution, differs from the German somewhat and has found more popularity in Southern Europe, Latin American, Russia, and, even in some aspects, Japan. The French higher education system consists of two tiers, with an elite and specialized upper tier of *grandes écoles* (e.g., Napoleon's *École Polytechnique*, *l'École des Mines*, *l'École des Langues Orientales Vivantes*). The lower tier consists of the more traditional universities, with their more general curriculum. This large number of higher education choices has led to intense competition both among institutions for students and among students for entry to the more prestigious institutions – a triumph for meritocracy. Placing the "practical" institutions at higher status than the older, more traditional institutions, in a sense, also announced the triumph of the Industrial Revolution over the remnants of the medieval order.

United States

In the United States, higher education began in the colonial period primarily in church-affiliated institutions with modest equipment, scarce funds, and narrow entrance requirements, such as proficiency in Latin and Greek. Preparing students for religious ministry was a primary function of higher education in this period. Access was limited to a select group of intellectual and political elite intended to become community leaders, who studied the classics, religion, and philosophy. The main emphasis, while not the only one, was not so much to gain new knowledge, but to transmit and so preserve the "Western intellectual heritage."[11] Over a dozen higher education institutions were founded in the United States prior to the American Revolution, including Harvard (1636), William and

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[11] Brubaker and Rudy, pp. 22-23.

Mary (1693), Yale (1704), the University of Pennsylvania (1740), and Moravian College (1742).[12]

While U.S. higher education remained little changed for nearly 200 years, the 19th century brought many changes, particularly in the multiplication and variation of higher education institutions. By the time of the Civil War, many U.S. states founded public state universities, accompanying the numerous private institutions that already existed scattered throughout the country, many of them liberal arts colleges associated with religious denominations. The Morrill Act of 1862 provided a further impetus to the growth of American higher education. The federal government gave large tracts of land to each state under the stipulation that "land grant" universities be established there.[13]

Since the end of World War II, higher education has grown dramatically. To meet the growing demand, responsive governments, aided by sufficiently strong economies, facilitated access by subsidizing loans and grants to both individuals and institutions. They also diversified the character of higher education institutions by creating two-tier university systems in some states and community college systems in most states. Where governments have not been responsive enough, private institutions, ranging from some of the world's most prestigious universities to less prestigious proprietary schools, emerged to fill the void.

Russia

Tsarist Russia founded many academies and technical institutes but few universities, both in fear of their perceived potential for sparking revolutions and in ambivalence toward the Western influences they would surely bring. Only one university – Moscow – existed prior to 1800, and less than a dozen were established in the next 100 years. By the eve of World War I, Russia had as many students enrolled in technical institutes and polytechnics as in universities, but the total number enrolled was still tiny by comparison with the huge size of the country – less than 0.1 percent of the population enrolled in higher education.[14] By contrast, the United States in 1914 had a higher education participation rate over three times as high (0.38 percent).[15]

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[12] ***World Almanac***, pp. 226-240.

The current Russian Federation, of course, inherited a higher education legacy directly from the Soviet Union, rather than from its imperial predecessor. From the 1930s to the 1990s, Soviet higher education was managed separately by over 20 different federal ministries vertically within the highly centralized communist government (i.e., each ministry had its own university or universities). This organization reinforced pedagogical and curricular narrowness. Each ministry had its institutions that were separate from the others in terms of the location of facilities, academic programs, and labor market planning, even if in close proximity in the same city. Legally, the universities were "owned" by federal sector ministries and, within them, students specialized in tightly bounded curricula. Since 1990, more focus has been placed on employment and the labor market, coincident with attempts to reorganize programs and broaden fields of study to be more flexible to the country's changing needs.[16]

Japan

Japan started to convert administrative schools for samurai warriors into imperial universities in the late 1800s, freely importing Western university administrative structures, in the hope that Western science, technology, and wealth would come simultaneously. The universities were soon followed by many other colleges and institutes, more of them private than public.[17]

The Monbusho, or Japanese Ministry of Education, was established in 1871 but, until 1948, higher education institutions operated independently. With the Fundamental Law of Education in

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[13] Brubaker and Rudy, pp. 59,70.

[14] Perkin, p. 187

[15] U.S. Department of Education, *120 Years of American Education*, pp. 11, 76

[16] World Bank, ***Russia: Education in Transition***, pp. vii–viii

[17] Perkin, pp. 197-198

1947, a single track 6-3-3-4 system (6 years primary, 3 years middle school, 3 years high school, 4 years university) was adopted. University entry and, from 1950, places in junior colleges, have been in very high demand.[18]

These examples of diverse evolutionary paths resulted in very different systems of higher education in the United States and other developed countries. Nonetheless, even though higher education systems maintain the diversity resulting from their separate historical legacies, in many respects they also seem to be converging toward more similar systems.

Recent trends in higher education systems

Three major trends have characterized higher education across OECD countries in recent years: massification; diversification; and convergence. Diversification, in turn, is manifest in two forms: by institution type and by regionalization. We will return to each of these themes in turn.

Massification

"Massification" is a term commonly used by higher education analysts to describe both the growth trend in higher education enrollment in recent decades and the inclusion of social groups which for centuries did not have access to higher education.

Sweden is unique in our comparison group of countries for maintaining about the same level of participation in the 1990s as in the 1970s. In most other countries in our group — Australia, Japan, France, Germany, Italy, Spain, Switzerland, and the United Kingdom — the level of participation since 1970 has more than doubled.[19] Enrollments in U.S. institutions of higher education have increased more than six-fold since 1950. (see Figure 1.2)

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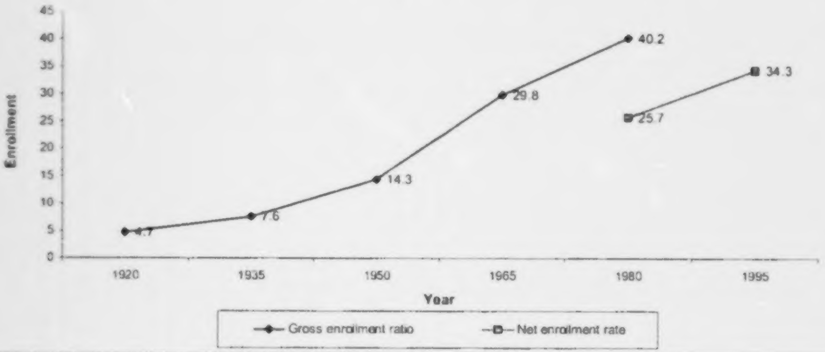
[18] OECD, ***Education at a Glance, 1996***, p. 295; ***Monbusho, 1996***, p. 16

[19] OECD, *Alternatives to Universities*, Table 1.A; OECD, ***Education at a Glance, 1995***, Table P1t.

Figure 1.2: Enrollment in United States institutions of higher education per 100 persons aged 18 to 14 (before 1980) and net enrollment rate for persons aged 18 to 24 (after 1980): 1920-1995



* Points marked prior to 1980 are gross enrollment ratios: all enrolled at any age divided by the total number of 18-24 year olds in the population. Points marked from 1980 on are net enrollment rates: the number of 18 to 24 year old higher education students divided by the number of 18 to 24 year olds in the population.

SOURCE: U.S. Department of Education, National Center for Education Statistics, ***120 years of American education: A statistical portrait***, Table 24, pp. 76-77; U.S. Department of Education, National Center for Education Statistics, ***The Digest of Education Statistics***, 1997, Table 186, p. 196. (See also Table B1.2 in Appendix B)

The growth in participation of recent decades has affected the physical size, number, and administrative structures of higher education institutions. The rapid expansion of institutions in the past quarter century required centralized planning and coordination, and the central administrations of higher education systems expanded in order to accomplish these tasks. Traditional universities, which had been administered by "collegial" forms of organization, were forced to adapt to more "corporate" organizational forms, both to manage the enlarging size of higher education institutions and the rapidity of change. In the United Kingdom, for instance, reforms have been underway aiming to expand the powers of university presidents and central administrations. These reforms intend to support the central authorities in setting university priorities and agenda, and apportion resources accordingly.[20]

One observer asserts:

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> "Still more crucial was the unsuitability of collegial decision-making structures to come to grips with the problems of resource reduction. The structures in place were simply too slow and cumbersome to meet the needs for timely responses to the problems which institutions were facing. Nor were they effective for taking the kind of cost-cutting and resource reallocation measures which were called for. Given this situation, decision-making power was gradually transferred to the large, central administrations which had come into being during the period of expansion."[21]

Another observer describes several ways in which public higher education institutions can be made to be more responsive, without completely privatizing them. All of the following methods are being tried in higher education institutions throughout the OECD today:

- Competition (for students, faculty, funds, reputation) – an important condition for the vibrancy of the U.S. system;
- Multiplicity of funding sources (no predominant dependency on a single funding institution) – another important difference between U.S. and European higher education; the U.S. institutions can and must compete with others for scarce public, private, and foundation funds;
- Consumer power – giving students vouchers to attend any higher education institutions they wish, for the same price as a public institution;
- Serving multiple constituencies (serving different interests at the same time and being publicly accountable for that) – a built in protection against the danger of falling under the control of a single group; and
- Public view of quality – as in the public availability of information on performance, as in the well-known university rankings in U.S. magazines, or that derived from visiting accreditation committees.[22]

Some analysts argue that rapid growth and large size have led higher education institutions to adopt "…techniques developed and first applied in the private corporate sector...inspired from…the United States….the most successful example of a 'market driven' [higher education system with] 'pseudo-market mechanisms' [such as] university-industry links, service contracts for business [and]

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[20] de l'Ain, p. 91.
[21] LeVasseur, p. 13.
[22] McDaniel, pp. 115–125.

full cost fees, cost sharing, individual financing [and other procedures that demonstrate] 'you now pay for what you used to get for free.'"[23] (It was common in European universities, in the few decades after the second world war, for students to attend university for free and, in some cases, receive a stipend for room and board.)[24]

Unfortunately for "the masses," who now often pay for what society's elite in some countries used to get for free, the massification of higher education has also muddied the formerly clear path to success in the labor market. As one commentator writes, "A substantial increase of university-trained persons does not allow, by definition, all of them to be among the 'chosen few'." Europeans and North Americans alike found some university degrees leading to the unemployment line in the mid-1970s (coincident with the Arab oil embargo). Some have argued that in countries with open admissions to higher education, the number of graduates will always exceed employment demand, because some attend university for reasons less related to employment than "intrinsic rewards" or "social status".[25]

Diversification by institution type

The expansion of higher education in the last quarter century occurred both through the extension of the existing university sector (partly by founding new universities or, in the United States, expanding small 4-year colleges) and through the development of alternative educational structures. As a consequence of this institutional differentiation throughout the OECD, "...there emerged in most systems more practically and vocationally oriented forms of higher education than the universities. Thus, for instance, in the United States and Canada the community colleges, in Great Britain the polytechnics, or in Western Germany the *Fachhochschulen* began to constitute a major counterweight to the traditional universities."[26] An OECD study of 1973 identified three general models for *alternative* higher education institutions:

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[23] Neave, pp. 18-20.
[24] Williams, pp. 47-51 and Kogan, p. 153.
[25] Teichler, pp. 27–29.

- **The "multipurpose" model** corresponds to the characteristics of most community colleges of North America, offering general and vocational courses and qualifications, as well as the first two years of the four-year university first degree (undergraduate) programs and, increasingly, a wide range of continuing education.

- **The "specialized" model** refers to those institutions that offer shorter, mostly vocationally oriented courses in a limited number of areas, leading to below-first-degree-level qualifications. A large number of post-secondary institutions in Continental Europe fit this model. In the United States, private "proprietary" schools fill most of this niche, and much of the rest is occupied by a small proportion of independent, non-profit schools. A few U.S. states, however, such as Indiana, Wisconsin, and South Carolina—and the Canadian provinces of Québec and Manitoba—established systems of 2-year vocational-technical institutes, rather than community colleges with general curriculum, and may fit this model better than the previous one.

- **The "binary" model**—is typically represented by the British polytechnics, as well as private and state "Tech" universities in the United States (e.g., the California Institute of Technology (CalTech), the Massachusetts Institute of Technology (MIT), the Georgia Institute of Technology (Georgia Tech), Drexel University, Purdue University), offering programs and qualifications intended to be distinct in curriculum from, but of a comparable duration and level of quality and rigor to those in traditional universities.

The political arguments for expansion once rested on two main political considerations: the "manpower approach," based on the conviction that the national output of highly qualified manpower had to grow, if the respective countries were to compete successfully on the world market in times of rapidly changing technology. The second, "social demand approach," related to overall educational and social aims, such as broadening access to universities from the traditional elite to the large numbers of gifted young people from the ordinary classes who, in previous times, were not given an opportunity to develop their latent talents. Under this mode of thought, higher education was considered a basic civil right.

In reaction to either or both considerations, public authorities introduced a series of measures to extend secondary education and to develop a wider range of programs at the post-compulsory level, designed to meet the needs and aspirations of new groups and to draw on the widest possible "pool of talent." They introduced or improved comprehensive systems of means-tested grants for students; and they directly funded the development of the missing programs or institutions needed to provide a diverse framework of higher education options. In Japan, in 1987, for example, such activities were entrusted to the University Council, an advisory organ of the Minister of Education, in an attempt to cope with the changing needs of society, rapid progress in science and technology, and population trends.[27]

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[26] OECD, ***Alternatives to Universities***, p. 12.

The dynamic process of diversification had several patterns. In some countries, "short-cycle" programs were offered within conventional universities, producing "internal differentiation" within "comprehensive universities." In the United Kingdom, for example, "universities are being asked to persuade departments to externalize their teaching away from singular demands of the discipline and toward the inculcation of qualities and skills outside those traditionally demanded by the academy.[28]

Most countries, however, opted to develop institutions outside the traditional universities, finding it either more advantageous to bypass the entrenched interests in the universities, or more responsive to popular or political desires to form new and separate institutions. Civic and political leaders who wanted flexible, responsive, and vocationally oriented institutions that could respond quickly to shifts in market demands often felt stifled by the structural and functional inertia displayed by the universities.

For example, New Jersey opened 19 new public institutions of higher education between 1960 and 1994, virtually providing one for each county. Sixteen of those new institutions were community colleges with degree programs of two years' duration or less. Only two such institutions existed in

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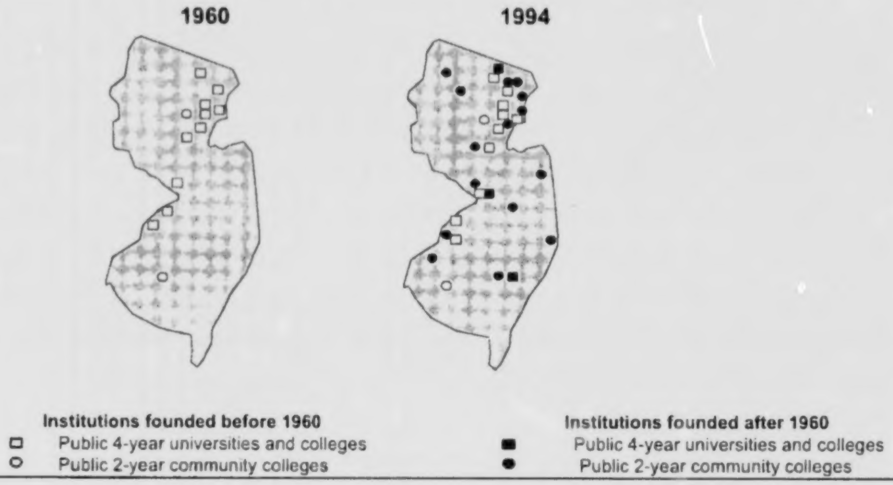
[27] T. Kanaya, p. 484.

1960. (See Figure 1.3)

Figure 1.3: Public higher education institutions in New Jersey, by date of founding and level of education: 1960 and 1994


1960
1994
Institutions founded before 1960
□ Public 4-year universities and colleges
○ Public 2-year community colleges
Institutions founded after 1960
■ Public 4-year universities and colleges
● Public 2-year community colleges

SOURCE: *The World Almanac and Book of Facts, 1995*, pp. 226–250.

These institutional alternatives to traditional universities typically were designed to be more practically and vocationally oriented, fulfilling specific needs of the economy, but also offering educational opportunities to formerly disadvantaged social groups, thus promoting equity goals. Usually, these alternatives were expected to be less expensive than universities.

In Germany, overall enrollments in higher education by 1985 were four times higher than in 1960. However, whereas the number of students entering traditional universities increased, those entering other higher education institutions, such as the *Fachhochschulen* increased by even higher rates. A comparison of university new-entrant patterns with those of the *Fachhochschulen* between 1960 and 1995 is displayed in Figure 1.4. Over the 35-year period, the number of new entrants to

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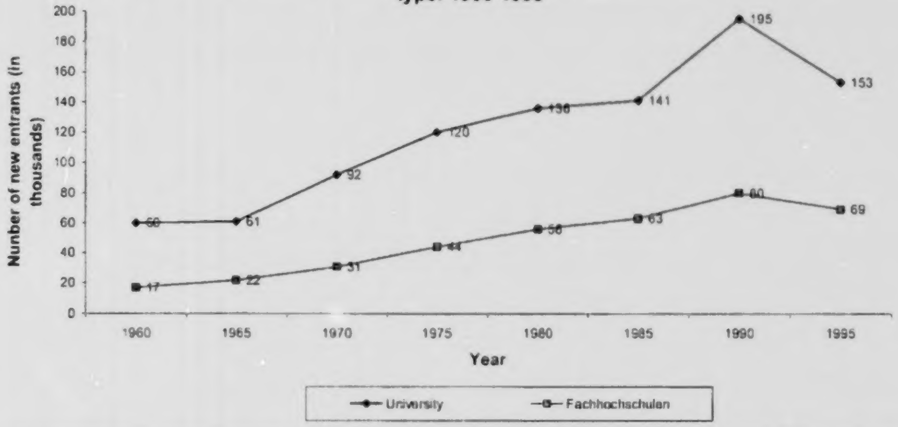
[28] de l'Ain, p. 91.

universities increased by a factor of 2.6, whereas at *Fachhochschulen* it increased by a factor of 4.1. *(Fachhochschulen* are the rough equivalent to U.S. or British polytechnics, are dominated by engineering, business studies, and the social sciences, and offer programs of three years or more in duration.)[29] Even this difference in growth rates may understate a relatively greater growth in interest in *Fachhochschulen* compared to that in universities. A survey of German university students found that 12 percent would have enrolled instead in *Fachhochschulen* if spaces had been available for them.[30]

Figure 1.4: New entrants to German* postsecondary Institutions, by instituion type: 1960-1995



* This figure only represents the number of new entrants from the former Federal Republic of Germany (West Germany).
SOURCE: Der Bundesminister fur Bildung und Wissenschaft, *Grund-Und Structur Daten, 1992-93*, p. 156 and *1996–97*, p. 146. (See also Table B1.4 in Appendix B.)

The "third sector" of "proprietary" schools common in the United States and Japan is diverse, privately-organized and financed, offers programs of brief duration, and is narrowly vocational. Many such institutions charge substantial tuition fees. In some countries, the existence of this sector has been encouraged by public authorities, but the institutions are distinctly not of government design. Indeed, their most distinguishing feature is that they can emerge directly in response to market demand, without the wait required by governmental deliberation. The emergence of this third sector is a fairly new development in European countries with no tradition of private higher education.[31]

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[29] Because *Fachochschulen* typically offer degree programs of three years or more, rather than two years or less, they are classified in the ISCED as "university" (ISCED 6), rather than "non-university" (ISCED 5). Similarly, first university degree programs in German universities are typically longer than four years. OECD, ***Alternatives to Universities,*** p. 40.

[30] Wagner, p. 9.

Japan is exceptional both in having a very good data series on "third sector" institutions, and in the role those institutions play in the dynamic process of institution forming. Most governments simply do not collect good statistics on the completely independent, private, fee-driven institutions, which may have no formal relationship with government education agencies. Nonetheless, in most of Europe and North America, the third sector is widely believed to be rapidly growing in size—from a base near zero just several years ago in some European countries. In Japan, proprietary schools (*Kakusho Gakko*) have existed for decades, and, until 1970, enrolled more students than did universities. Proprietary school enrollments have since declined, however, as universities attract the now more affluent Japanese youth who can afford an extended academic sojourn; and new public institutions – junior or technical colleges and "special training schools" (*Senshu Gakko*) – have been formed to meet similar needs. Proprietary schools led public institutions in Japan, showing them where the demand was and how to meet it. (see Figure 1.5) In Europe, proprietary schools are filling niches that public institutions either cannot fill or do not want to fill.

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[31] OECD, ***Alternatives to Universities***, pp. 12+.

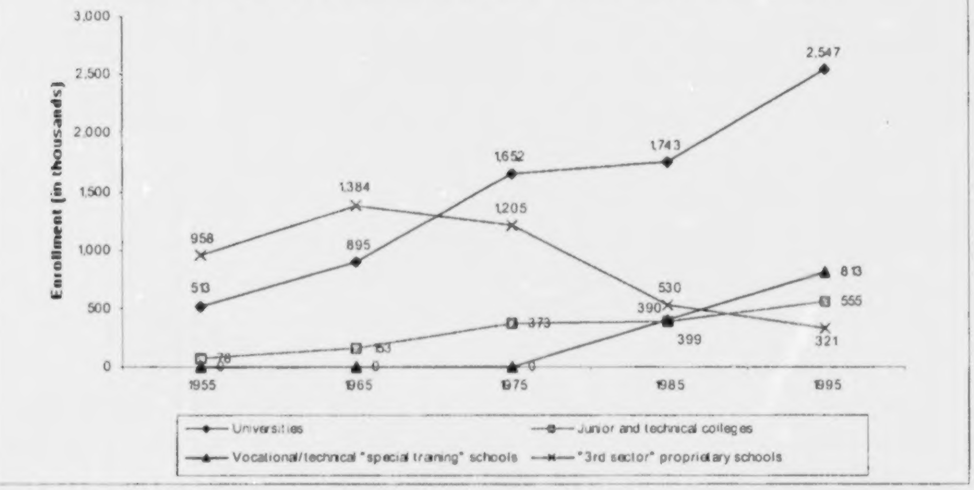

Figure 1.5: Enrollment in Japanese postsecondary institutions: 1955-1995

SOURCE: OECD, *Alternatives to Universities*, Table 16; pp.27–28, 43-44; and Ministry of Education, Science, Sports and Culture, Government of Japan, *Monbusho*, 1996, p. 17. (See also Table B1.5 in Appendix B)

It needs to be noted at this point that this diversification by institution type within higher education has not been ubiquitous among OECD countries. In Italy and Spain, non-university higher education institutions scarcely exist.

Diversification by regionalization

In recent years, the placement of new institutions has been dispersed geographically out of a desire to provide equal access to higher education (of equivalent quality), and out of a belief that higher education institutions stimulate local economic development. The issue of equal access, which had primarily been a national concern, became a regional issue once regional political authorities became involved in funding decisions; there were disparities in educational investment across regions within some countries as large as those across countries in the OECD. Policy makers believed that the higher the level of educational attainment a region had, the better were its chances of lowering

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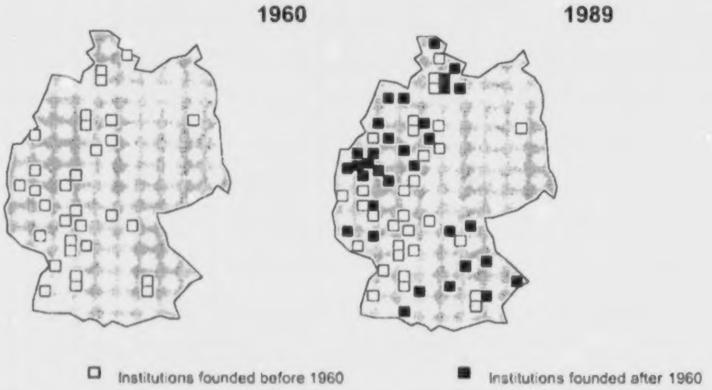
unemployment.[32] Regions in West Germany, for example, which lacked universities in 1960, were not content to open only new *Fachhochschulen*—they wanted universities, too. (see Figure 1.6)

Figure 1.6 : Public universities in West Germany, by date of founding: 1960 and 1989


1960
1989
Institutions founded before 1960
Institutions founded after 1960

SOURCE: H. Peisert and G. Framhein, ***Higher Education in the Federal Republic of Germany***, Federal Ministry of Education and Science, Table 3.

Economic development beliefs were coupled with a desire on the part of regional authorities to maintain greater control over labor market supply — regional education investments were often joined to geographically focused grants for "reskilling," training, and technology aimed at regional industries.

Three main types of arguments in favor of regionalization have emerged. First, increased access has led to the view of higher education as a "local service." Second, overcrowding in urban higher education institutions has made the notion of developing alternative strategies to avoid those costs an option. Finally, local authorities have recognized the political, social, and economic benefits available, in terms of profitable enterprises, in university research and development. Still other, lesser regarded arguments include: prestige and added intellectual development attract capital, investments and educated migrants, and higher education institutions generate local spending, "customer/supplier" relationships, and provide cultural and educational events.[33]

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[32] Bélanger and Lyck, pp. 221-228.

France's recent regionalization effort —*Université 2000*—planned to build many new higher education institutions dispersed throughout the country, including seven new universities. When complete, no French city of more than 100,000 in population was to lack a university, and the formerly underserved geographic center of the country was to host several non-university higher education institutions. As the regional governments of France have become aware of the potential economic benefits of having an institution nearby—and subsequently have been aggressive in promoting cooperation between their local higher education institutions and industries—the politics of higher education planning has grown intense.[34]

Unfortunately, some regionalization attempts have not produced the development anticipated. In Sweden, for instance, higher education institutions were established in the north in an attempt to develop that poorer, more rural area of the country. However, many northern students, once trained, migrated to the more developed south of the country, where they found better employment opportunities and more cultural and social amenities.[35]

Regionalizing higher education does not always mean placing new institutions in less populated areas. One could argue that the United States dispersed its universities geographically with the passage of the Morrill Act of 1862, which deliberately established "land grant" universities in rural areas. One consequence of the rural placement of many U.S. state universities, however, was a paucity of public universities in urban areas. Ergo, much of the regionalization of U.S. public higher education institutions in the past quarter century has been directed at placing new institutions or "branch" campuses in urban areas.

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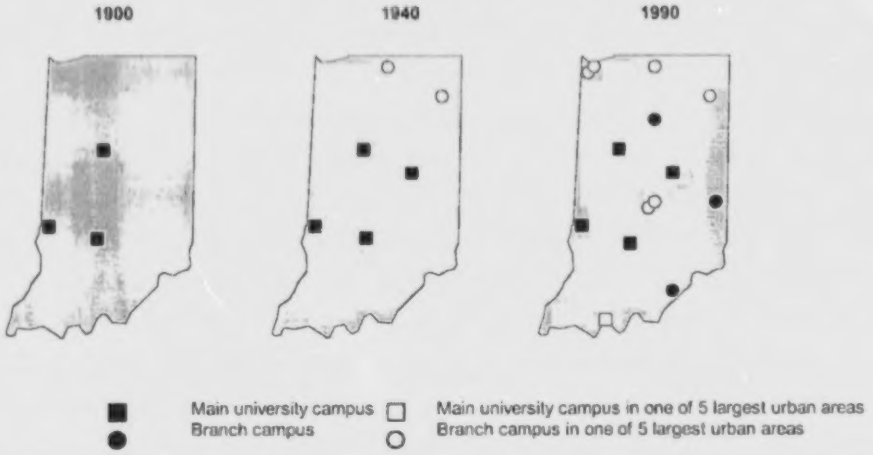
[33] Though building higher education institutions in more rural areas may benefit those rural areas, it may not benefit the country as a whole. Some empirical evidence supports the view that a country or state as a whole benefits more (in income and employment growth) by placing its universities in its largest urban areas. (see Phelps, 1998)

[34] Kennedy, pp. 32-34.

[35] de Gaudemar, p. 60.

Indiana began with three universities in 1900, all located in small cities. By 1940, two branch campuses of one of those original universities were opened in the third- and fourth-largest urban areas. By 1990, six branch campuses had been opened in the four largest urban areas. (see Figure 1.7)

Figure 1.7: Public universities and their branch campuses in the U.S. state of Indiana, by type of institution and urban or rural location: 1900, 1940, and 1990


1900
1940
1990
■ Main university campus
● Branch campus
□ Main university campus in one of 5 largest urban areas
○ Branch campus in one of 5 largest urban areas

SOURCE: ***World Almanac and Book of Facts, 1995***, pp. 226–240.

One observer offers three recommendations to potentially ensure that higher education instiutions contribute to the development of a region and play positive roles as regional actors[36]:

- The job market the students will face when they graduate is equally as attractive as the education programs that induce them to enroll;
- The regional education system recognizes both the short and long term job opportunities in the labor market of the graduates; and
- The education providers meet with the potential employers on a regular

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[36] de Gaudemar, p. 63.

> basis to ensure that graduates' skills will meet the needs of the labor market.

Whether planned or not, regional higher education institutions exist in a competitive market, for students, for graduates, and for research-generated knowledge. Whether they succeed or fail depends upon how accurately they regard that market and their own place within it, and the strategy they adopt to compete. Moreover, the degree of competitiveness of this market is expanding—with improvements in communication and transportation, increased wealth, and more efforts (such as those of the European Union) to facilitate the free flow of students and academic credits across country boundaries.[37]

A country's size naturally influences the optimum number and dispersion of higher education institutions. Luxembourg, for example, "…a country of only 300,000 people,…has a university center which offers only one-year courses after which students go on to universities elsewhere in Europe or beyond."[38]

Convergence

While higher education systems across the OECD countries are becoming more alike because they are learning from each other *ad hoc*, there exist some efforts toward convergence that are deliberate and coordinated. For example, the European Union has for some time tried to encourage student exchanges and coordinate the mutual recognition of academic credits, diplomas, and faculty credentials. EU officials are now attempting to dissemble courses of study into mini-units for the purposes of standard classification. These mini-units could be accumulated as "university ECUs," which would be acceptable throughout the EU – a "single currency" along the lines of semester or quarter credits in U.S. universities.[39]

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[37] de Gaudemar, pp. 57–58.
[38] de Gaudemar, p. 57.

The Maastricht Treaty of the European Union (named after the Dutch city where the treaty was signed) is most famous for the monetary requirements it imposes upon each country for entry to the European monetary union, with its single currency, the "euro." The Maastricht Treaty, however, also contains provisions for changes in countries' higher education system structures and degree requirements, in the hope that a more uniform European system can be developed, allowing for a freer flow of students and graduates across borders. In the past, if one country of the European Union did not automatically recognize all degrees and certificates from another country, then job applicants from the latter country were ineligible for employment in their field in the former country, even though they may have been well qualified.[40]

Aside from its efforts in promoting the exchange of students and student credits, the EU has fostered cooperation among education institutions and industry at regional, national, and European levels; inter-university cooperation at the European level; networks of education and research institutions; cooperation of the universities with the non-university sector; distance learning; and the promotion of innovative educational methods and media.[41] Various agencies of the federal government carry out these tasks in the United States (e.g., The U.S. Education Department, The National Science Foundation, The U.S. Department of Energy).

It would be inaccurate to suggest that all efforts at standardization and coordination across the members of the EU proceed smoothly, however, with the effort to standardize academic programs proving particularly nettlesome. The "single currency" of academic credits concept – or "aggregative" approach – to the curriculum acquisition of knowledge has met with fierce resistance from English and

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[39] de l'Ain, p. 85.

[40] de l'Ain, pp. 85-86, 94-102 and Tsaoussis, pp. 171-179.

[41] Tsaoussis, pp. 174–189 and Jouandreau, pp. 69- 75.

German educators, who feel that it undermines their ideal of the university, though their respective governments do not share those feelings. In the traditional English and German models of certification, a student's evaluation, and the granting of her certification, takes place at the end of the process and cannot be attributed piecemeal. It is the traditional craft-guild model – one is either an ironsmith or one is not an ironsmith. One cannot be one-sixteenth of an ironsmith. One demonstrates that one is an ironsmith by completing an appropriately demanding task that incorporates a full spectrum of skills learned. Although U.S. universities have adopted the "aggregative approach" to the accumulation of credits toward general degrees, the craft-guild apprenticeship model is not wholly foreign. Medical doctors, for example, are not allowed to practice unsupervised until they have demonstrated that they can do all that will be required of them.[42]

German universities represent perhaps the most sincere reproductions of their medieval antecedents, and present perhaps the clearest case to explain public and public officials' frustrations with the traditional certification model. German university students pay no tuition fees and may receive loans or grants to cover living expenses.[43] In return for this public largesse, the students do not obligate themselves to complete their studies within a fixed period of time, nor must they complete any work by any interim deadlines. Their attendance at lectures is optional and no tests are administered in respect thereof. Students must take part in about 10 seminars or tutorials, for which they obtain pass certificates, but their grades do not count toward their final certification. Students pick a list of works to master and are free to sit for their final examination whenever they feel ready. University studies are conceived as a solitary quest for knowledge, with assistance of occasional guidance from professors and readings.

This method is sometimes criticized, by fiscally conservative policy makers, as profligate and extravagant. Criticisms can focus on: "…a system that combines a highly protracted period of study and no charges to the student; …that leaves students for too long uncertain as to their prospects for attaining the credentials they seek."[44]

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[42] de l'Ain, pp. 83–93.

[43] Frackmann, p. 227.

One consequence of the encounter between the traditional apprenticeship model for student progress through the university and the massive increase in enrollments in recent years has been a large number of students failing final examinations, sometimes after long, protracted periods of study. This has prompted a sort of "halfway house" in the form of a *Vordiplom* ("pre-diploma") and a *Zwischenprufung* ("intermediate examination").[45,46]

Thus, gradually, even the German credentialing system becomes more like the "aggregative" systems used in France and North America, the type proposed as an EU standard.

Governance in higher education

Degree of institutional autonomy

Some universities, particularly some owned by religious denominations, exist under specific, centuries-old treaties signed in perpetuity between the government and their church. Even most public universities in most OECD countries retain a legal status as constitutionally embedded and chartered corporations with almost universal rights of self-recruitment and self-management. There are, however, differences among countries with respect to the actual degree of independence of the universities from state control. Universities in the United Kingdom, for example, despite measures taken in recent years to ensure a greater degree of planning and financial accountability, are still to a large extent free to manage their own affairs. In contrast, university administrations in Germany and the United States have always been more directly accountable to their respective state governments.[47] Interestingly, in Russia, the once centralized education system of the Soviet Union now allows individual higher education institutions to set their own agenda and govern themselves in many respects.[48] Similarly, Sweden initiated a major reform in 1991, deregulating the unitary system of higher education toward one of greater autonomy for the institutions.[49]

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[44] de l'Ain, p. 90.
[45] de l'Ain, p. 90.

In virtually all OECD countries, the majority of university faculty still enjoy tenure.[50] That is often not the case with teachers in non-university higher education institutions, however.[51] Generally, governments have more direct control of non-university higher education institutions than they do of long-established universities. Indeed, that is one of the reasons governments established such institutions. Faculty in non-university higher education institutions also are less likely to be engaged in research than their university counterparts; and they are likely paid less than their university counterparts…for teaching more often…to larger classes of students.[52]

Some faculty in non-university institutions in some countries enjoy a say over the management of their institutions similar to what their university counterparts enjoy. Japanese junior college professors, for example, are members of "faculty councils," which decide matters concerning all academics and organization. Teachers at the other two types of Japanese non-university higher education institutions, the "special schools" and the technical colleges, have no such authority. In fact, most faculty in non-university institutions in most countries have little management authority. As for teachers in the "third sector" proprietary schools, they have the status of "hired help" in a hierarchically run commercial enterprise.

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[46] de l'Ain, p. 95.
[47] OECD, ***Alternatives to Universities***, pp. 49–51.
[48] Nikandrov, p. 824.
[49] OECD, ***Education at a Glance, 1996***, p. 324.
[50] OECD, ***Alternatives to Universities***, p. 54.
[51] There are exceptions. In Germany, for instance, professors at *Fachhochschulen* are civil servants, just as they

Private institutions and privatization

In several European countries, private higher education institutions have either not been permitted, as in Germany or Russia, or strongly discouraged, as in the Scandinavian countries. The state was expected to provide for all that qualified for entry. An inevitable result of ignoring demand for education was excessively large class sizes, large numbers of students attending courses in other countries, ferocious competition for entry, and state responses to fairly control access (such as examination systems).[53]

One can find many private institutions in Japan, of all levels and types, many of them "off-shore" campuses of American or European universities. In Japan, however, students in the "National" (public) universities pay lower fees. Because of their lower costs, those national universities are most students' first choice, and they retain higher prestige. Private universities and colleges cater to the less lucky applicants with families willing to pay substantial amounts for their sons and daughters to attend in a society where education is seen as the prime route to social and economic development.[54]

Some reasons students choose private colleges in the United States include a preference for an institution affiliated with their religious denomination, a smaller college setting, a high-prestige private university (in return for a high tuition payment), or a technical institute with a curricular focus not offered at public institutions, or, perhaps, not offered nearby.

Private institutions are now sprouting up in Eastern Europe in response to a demand for courses the traditional universities were not allowed to offer 10 years ago. These institutions fill market niches generated when the heavily bureaucratized public universities were unable to respond

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are in universities.

[52] OECD, ***Alternatives to Universities***, pp. 49–51, 54–55.

[53] Williams, pp. 44–46.

rapidly enough to the needs of rapidly changing economies.[55]

Many private higher education institutions are not purely commercial profit-motivated enterprises, of course. Many are non-profit trusts, which can receive their income from public or private sources, or both. Moreover, public institutions might receive a substantial portion of their income from student fees or from consulting or contract work.

The fairly common, non-profit trusts generally give up some financial independence in return for some financial privileges, such as tax exemptions. One form of trust common in Europe consists of universities owned by a church. Their legal position is usually regulated by a *concordat,* which was agreed at some time in the past, usually as part of a much wider church/state agreement. Another form of trust, common in the United States and the United Kingdom, is a legal instrument that prescribes a status for universities similar to that of charitable foundations.

The OECD uses the term "government dependent" to describe these private institutions. If the government is spending money at these institutions, how the money is used becomes a matter of public concern and political notice. Some analysts argue that the boundaries between non-profit and profit have blurred in recent years, as some higher education institutions held in trust have sought new sources of income from activities little related to instruction.[56]

Summary

The character of today's higher education institutions was formed by a multiple historical legacy. Originally formed in Europe's Middle Ages, universities retain some of that era's organizational structures and procedures, modeled on those of craft guilds and monasteries.

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[54] Williams, pp. 44–46.
[55] Williams, pp. 44–46.
[56] Williams, pp. 46–47.

Nineteenth-century innovations, particularly in France and Germany, developed the basic structural models used today to govern the large complex institutions that higher education institutions have become. Another historical legacy dates only from the post-World War II era. Three trends characterize this recent legacy—massification, diversification (by institution type or region), and convergence.

Massification refers both to the high-growth trend in higher education enrollment in recent decades (a doubling in most countries), and to the inclusion of social groups that for centuries had no access to higher education. *Diversification (by institution type)* refers to the emergence of more practically and vocationally oriented forms of (usually "short-cycle" public) higher education (than the traditional universities), such as community colleges and polytechnics, and more market-oriented and flexible private institutions, ranging from highly focused, short program "proprietary" schools, to "niche market" vocational institutes and professional schools, to prestigious universities.

Diversification (by regionalization) refers to the geographic dispersal of higher education institutions, through the formation of both new institutions and branch campuses of established institutions. Regionalization owes its impetus to a desire for both equal access to higher education and a belief that higher education institutions stimulate local economic development. *Convergence* refers to the trend in countries' higher education systems of becoming more alike as they learn from one another, enter into cooperative programs, or coordinate mutual recognition of academic credits, diplomas, and faculty credentials.

In governance, higher education institutions can be public, private, and many "shades" in between. Many of the oldest universities are operated by religious denominations, exist under specific centuries-old treaties signed in perpetuity between the government and their Church—which established such institutions as constitutionally embedded, chartered corporations with almost universal rights of self-recruitment and self-management. Other institutions embody some characteristics of private management with substantial amounts of public funding. Still other institutions are more clearly publicly managed and publicly funded. The type of governance can affect many important institutional decisions.

All of the aforementioned trends in higher education have inevitably affected its governance. Higher education institutions are now administered in a more centralized manner even while institutions have dispersed geographically and diverged in character. Funding mechanisms have also become more diverse. Higher education institutions have become more "market-oriented." This dispersion and divergence *within* countries has paralleled a convergence of higher education administrative practice *across* countries.

CHAPTER 2

STUDENT PARTICIPATION IN HIGHER EDUCATION

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STUDENT PARTICIPATION IN HIGHER EDUCATION

A variety of inter-related factors affect the degree to which higher education is available and accessible to the general population—whether it is reserved for an elite group or open to the masses. The percentage of the population that participates in higher education reflects: the value that a country places on advanced education; the society's financial investment in the system; and the economic need for a highly educated and skilled workforce. Faced with this latter need in an increasingly competitive and global marketplace, many countries have taken a clear interest in providing access to higher education for the largest pool of talent possible.

International comparisons of participation in higher education, however, can be problematic in several respects. The variation among higher education programs, both within and across countries, limits one's ability to make unqualified comparisons across countries based on indicators. For instance, some countries classify educational programs as higher education that other countries might assign to upper secondary education, thus contributing to the variation in enrollment rates within levels, across countries.

It also is important to consider the manner in which countries "count" students. For instance, the data presented in Figure 2.2 are based on head counts—each student is counted and weighted equally, regardless of his or her enrollment status. As a result, these data do not reflect any distinction between part-time students, who may be employed full-time and who may be taking only one course per semester, and full-time students, who may not be employed. While in the United States a statistical distinction is made between part-time and full-time students, some other nations do not distinguish between those two groups of students in the data they report to the OECD. Whenever possible, this report will distinguish between part-time and full-time students. The OECD defines a full-time student as one who is enrolled in an education program and commits at least 75 percent of his time to that program.[57]

More background information can be found in the "Note on enrollment and completion ratios" in Appendix C: Technical Notes.

Trends in higher education participation

Across countries, how has participation in higher education changed over time?

Higher education, in most countries, has been transformed over the last two decades. A variety of conditions have supported a rapid growth and diversification in higher education programs. The need for a well-educated and technologically sophisticated workforce provided one justification for increasing access to higher education. Demands for social equity provided another. While, traditionally, higher education had been reserved for a small elite, most OECD countries have now opened it to the masses. Consequently, the number of both students who participate in higher education and types of higher programs available to them have increased over time.

Figure 2.1 shows the proportion of 5- to 29-year-olds enrolled as full-time students in public and private higher education institutions in 1975, 1985, and 1995. Over this 20-year period, participation in higher education increased among all the countries shown, except for Sweden between 1985 and 1995.

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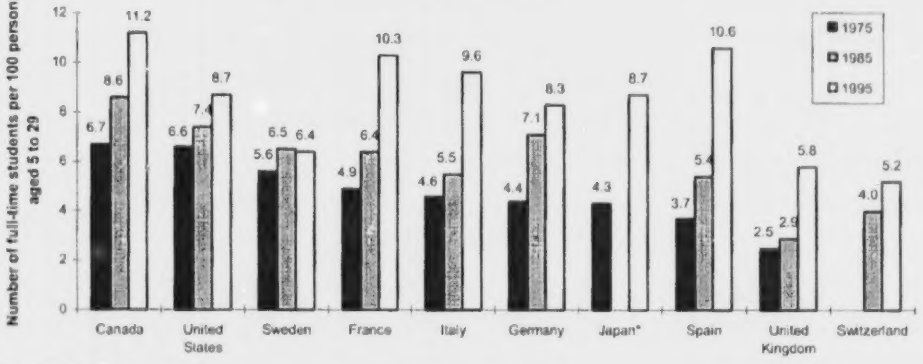
[57] However, even the classification between full- and part-time students simplifies reality, as it "lumps" all students into only two groups, regardless of their course load. Full-time equivalence measures (FTEs) attempt to standardize every student's actual load against a normal full-time course load. Where detailed data and norms on the level of individual participation are available, an FTE is measured as the product of the fraction of the normal course load that a student's course load represents, and the fraction for the school/academic year. When actual

Figure 2.1: Number of full-time students enrolled in public and private higher education institutions per 100 persons in the population aged 5 to 29, by country: 1975-1995



*1985 data for Japan are missing.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997.* Table C1.1. (See also Table B2.1 in Appendix B)

While enrollment in higher education rose in most countries over the last two decades, the pace of the increase differed from country to country. The United Kingdom (+ 100 percent), Spain (+ 96 percent), Italy (+ 75 percent), and France (+ 61 percent) all had a relatively rapid increase in the number of full-time students enrolled in higher education institutions over the last 20 years. The increase in Sweden, Germany, and the United States (+ 18 percent) was slower.

The more rapid increase in higher education enrollment in France, Italy, Japan, and Spain may reflect, in part, relatively lower enrollment bases in 1975, and the recent growth of the economy. In effect, they may have been "catching up" in their economic development relative to other OECD countries. The United Kingdom has substantially restructured its higher education system over just the last decade, expanding access to a greater share of the population.

Records of average annual growth rates of total enrollments in higher education (based on headcounts) from the past three decades show that virtually all the OECD countries experienced high rates of growth in the early 1970s. The United States was, perhaps, unique in maintaining a fairly

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study load information is not available, a full-time student is considered equal to one FTE.

constant rate of growth over the past quarter century. Most of the OECD countries in our comparison group experienced uneven rates of growth, and a few even sustained brief declines in enrollment. Australia experienced its highest growth rate in the past quarter century from 1970 to 1974, as did Germany, Spain, and the United States. Sweden's and Switzerland's growth rates peaked in the late 1970s. Canada's peaked in the early 1980s. Still other countries – France, Italy, and Japan – have just experienced their largest increase in higher education enrollment of the last quarter century in the early 1990s. (OECD, ***Alternatives to Universities***, Table 1.A; ***Education at a Glance, 1995***, Table P1t)

Sweden alone in our comparison group of countries, has maintained about the same level of enrollment in the 1990s that it had in the 1970s. In most other countries in our group – Australia, Japan, France, Germany, Italy, Spain, Switzerland, and the United Kingdom – enrollments since 1970 has more than doubled. (OECD, ***Alternatives to Universities***, Table 1.A; ***Education at a Glance, 1995***, Table P1t)

Levels of participation in higher education

How does the level of participation in higher education differ across countries?

Figure 2.2 displays the number of students enrolled in public and private higher education per 100 persons in the population aged 5 to 29. The majority of the countries included in Figure 2.2 have between 9 and 11 percent of their 5- to 29-year-old population enrolled in higher education.[58] The range across countries is relatively wide, from 7 percent in Switzerland to 15 percent in the United States and Australia, and 17 percent in Canada. It may be the case that, other factors held equal, places in higher education institutions are more accessible in countries with higher enrollment rates, such as

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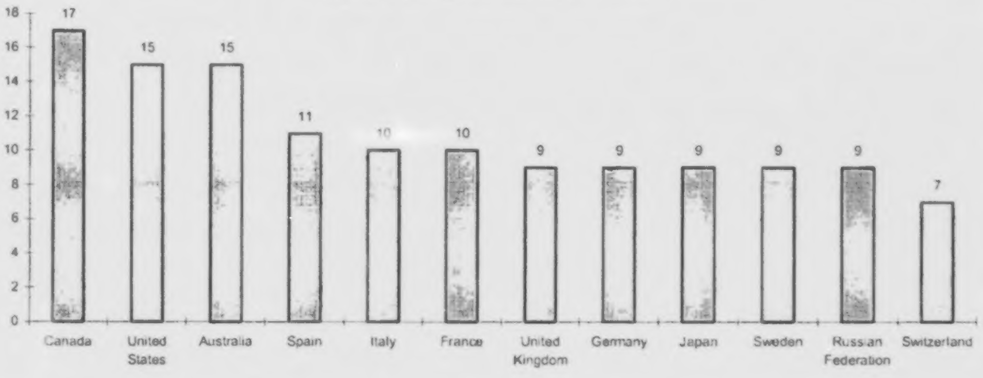
[58] The group aged 5 to 29 may seem an odd reference group for higher education participation. It was, however, the only reference group for which all the countries in our focus group had enrollment data. Japan, Italy, and Russia could not provide enrollment data for the more appropriate 17 to 34 years age group, and France and Sweden could not provide it by level of higher education. The rank order of countries by level of participation for that age group was virtually the same as for the 5 to 29 years age group, however, with only Spain and France

Australia, Canada, and the United States.

Figure 2.2: Number of students enrolled in public and private higher education per 100 persons in the population aged 5 to 29, by country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table C1.1a. (See also Table B2.2 in Appendix B)

Another explanation for the variation across countries in higher education enrollment rates lies in an understanding of how education programs are assigned to the different levels of education by the ISCED classification scheme. To a certain extent, the levels of education—primary, secondary, non-university higher education, and university higher education—form an arbitrary classification structure. Primary and secondary education need not span 12 years of a child's life, as in the United States, for example; in some countries, primary and secondary education spans 11 years, or 13 years, or some other range of years.

As a result, students typically enter higher education institutions across countries at different ages — 17 in Canada, the United States, Japan, Spain, and the United Kingdom; 18 in France, Germany, Italy, Sweden, and Switzerland; and 19 in Australia — with different expected durations in their university careers — ranging from 0.7 years in Switzerland to 2.2 years in Spain.

~~reversed in the order.~~

Students may begin their higher education with varying types of preparation. There are no countries where all students stay in the same type of school from age 5 to age 25; all education systems break up the student career at certain points that determine when students will attend a different kind of school than the one they attended the year before. All education systems at some point also split schools up according to curricular specialty or some other typology, and force students to make vocational choices.

In some countries, such as the United States and Canada, virtually all students enter varying types of higher education having received a roughly equivalent amount of exposure to a general studies curriculum. In other countries, such as Japan and Switzerland, students have been tracked into different schools, with different curricular themes and different durations at the upper secondary level. In still other countries, such as Germany, Italy, and Sweden, students are already tracked into different schools with different curricular themes at the lower secondary level.

The three types of education systems are illustrated in Figure 2.3. The United States represents the first model, wherein the curricular split occurs first at the higher education level. Most of Canada's provinces fit into the first model. Japan represents the second model, wherein the curricular split occurs first at the upper secondary level. Most Swiss cantons and the Canadian province of Manitoba fit into the second model. Germany represents the third model, wherein the curricular split occurs first at the lower secondary level. Italy and Sweden fit into the third model.

Other countries have systems which "overlap." Australia and Russia have systems with elements of both models 1 and 2; France's system has elements of both models 2 and 3.

Figure 2.3: Three education system models

Primary school level	Lower secondary level	Upper secondary level	Higher education level
Model 1: Curricular split first occurs at higher education level **UNITED STATES:**			
elementary school (6)	middle/junior high (3)	high school (3)	university (4) community college (2) vocational/technical institute (1-3)
Model 2: Curricular split first occurs at upper secondary level **JAPAN:**			
shogakka (6)	chugakko (3)	koto senmon-gakko (3) teijisei katei (3) tsushinsei katei (4) zennichisei katei (4) senshu-gakko (3) kakushu-gakko (3)	koto senmon-gakko (2) daigaku (6) tanki-daigaku (3) senshu-gakko (3) kakushu-gakko (3)
Model 3: Curricular split first occurs at lower secondary level **GERMANY:**			
Grundschulen (4)	Hauptschulen (6) Integrierteklassen (6) Realschulen (6) Gesamtschulen (6) Gymnasien (6)	Berufschulen (3) (Duales system) Berufsaufbauschulen (2) Fachgymnasien (2) Berufsfachschulen (3) Gesamtschulen (3) Gymnasien (3)	Schulen des Gesundheitswesens (3) Fachschulen (4) Fachochschulen (4) Universitaten (6)

Legend: name of school (typical duration in years)

SOURCE: Organisation for Economic Co-operation and Development, ***Education at a Glance, 1996***, pp. 278, 294, 337.

In the United States, all students are kept in a general studies curriculum until the end of high school.[59] Many students choose a vocational or academic orientation, but the core curriculum is much the same and higher education remains accessible to graduates of any high school program. Higher education offers students a wide variety of choice of institution types and curricula. The structure is similar in most of Canada. Many other countries, however, do not know this clean break between upper secondary and higher education, with all students changing at once.

In the United States, the break between what is secondary education and what is higher education seems distinct; in other countries, the break is not so clear. Moreover, few other countries wait until the higher education level to split schools up by type and curricular specialty. In some countries, secondary schools offer longer courses of instruction to students through their early twenties. In some countries, specialized secondary schools offer clear articulation to similarly specialized schools at the postsecondary level.

As one can see in the "Model 3" education system structure in Figure 2.3 that characterizes the German, Italian, and Swedish systems, students make a curricular choice (or it is made for them) as early as the beginning of lower secondary school. This type of system offers great efficiency to the student who knows at an early age the kind of occupation he or she will enter as an adult, and maintains that focus throughout their school career. Starting in lower secondary school, the German, Italian, or Swedish student can avoid "wasting" time in courses not related to their vocational interest and focus on courses that are. That way, a student can get through the system quickly and graduate with a vocational or professional credential at a relatively young age.

The Model 3 structure, however, can penalize those who change their minds. A German student who chooses the less academic, more vocational curriculum of the *Hauptschule* or *Realschule* at the lower secondary level, and then the *Berufsschule* vocational apprenticeship program at the upper secondary level, will be ill-prepared to pass the *Abitur* examination, a necessity for entry to university. The student would have to enter the *Zweiter Bildungseig* (second educational route) in order to catch up on all the academic track course work missed in secondary school or perhaps attend an *Abendgymnasien* (evening grammar school) program that prepares older students for the *Abitur*. These kinds of school careers, for students who delay occupational choices or change their minds about them, can become very protracted in duration.

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[59] Though, in recent years, secondary schools in some parts of the United States have started to specialize, as

This diversity in education system structures shown in Figure 2.3 affects how school programs get assigned to levels of education in the ISCED. The UNESCO/OECD levels of education classification scheme generally assigns programs to levels based upon the level of educational attainment required for entry. Nursing programs in the United States, for example, require high school degrees for entry, so the programs are classified as higher education. In Germany, nursing programs require a lower secondary school degree for entry, so the programs are classified as upper secondary.

In the German system students master a nursing curriculum at an upper secondary level *Fachoberschule* that is as rigorous as those found in higher education institutions in other countries. These advanced students will have attended a *Realschule* or *Gymnasien* (at the lower secondary level) that specializes in science and mathematics. The graduates of these early specialization programs may not be "broadly educated" at the end of their school careers, but they will be technically capable in their vocational specialty.

This diversity in education system structures also affects our comparisons of higher education participation across countries. For an illustration, look at Figure 2.4. It shows the net enrollment at age 19 by type of institution in 3 countries with very different education system structures in 1995. In Switzerland, with a dual system and early specialization, over half of 19 year olds were still enrolled in secondary school and only small percentages in higher education. In Spain, with a traditional education

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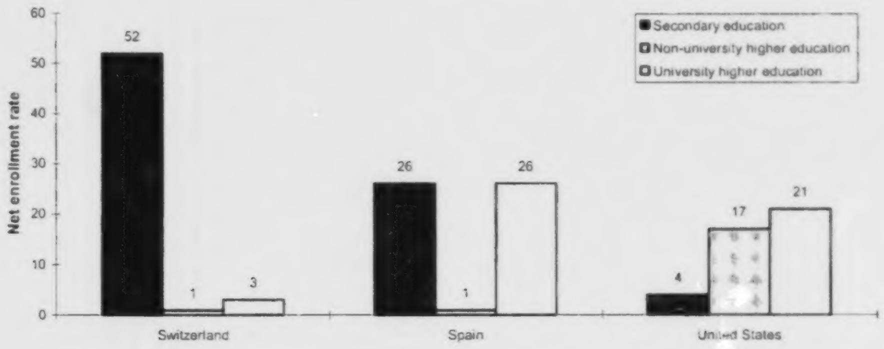
charter schools or career academics, for example.

system that had not diversified by establishing many "non-university" higher education institutions, equal numbers of 19-year olds were enrolled in secondary school and at university. In the United States, with a common, general curriculum through secondary school and wide curricular choice only at the higher education level, all but a small proportion of 19 year olds were enrolled in higher education, with a relatively large proportion in non-university higher education institutions.

Figure 2.4: Net enrollment rates of 19-year-olds in Switzerland, Spain, and the United States, by level of education (based on head counts): 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997.* Table C3.3. (See also Table B2.4 in Appendix B)

The reader may note that, while the United States had the largest proportion of 19 year olds enrolled in higher education (38 percent, compared to Spain's 27 percent and Switzerland's 4 percent), it had the lowest proportion enrolled in any level of education (42 percent, compared to Spain's 53 percent and Switzerland's 56 percent). Ironically, while the U.S. seems to have larger enrollments in programs classified as higher education, one could argue that the U.S. population is the "least educated." This contrast holds up even when the 19-year-old U.S. enrollment rate is compared to that in 8 other countries of our focus group, with Sweden possibly representing the only other country with fewer 19-year olds enrolled in school.

Figure 2.5 reveals the same information as Figure 2.4, but for all of our focus group countries with net enrollment data. Once can see that Germany's pattern of 19-year-old enrollment across the three levels of education resembles Switzerland's. The patterns for France, Sweden, Australia, and the United Kingdom are different from Switzerland's and resemble the Spanish model more closely than that of the United States. Canada's pattern clearly resembles that of its geographic neighbor to the south.

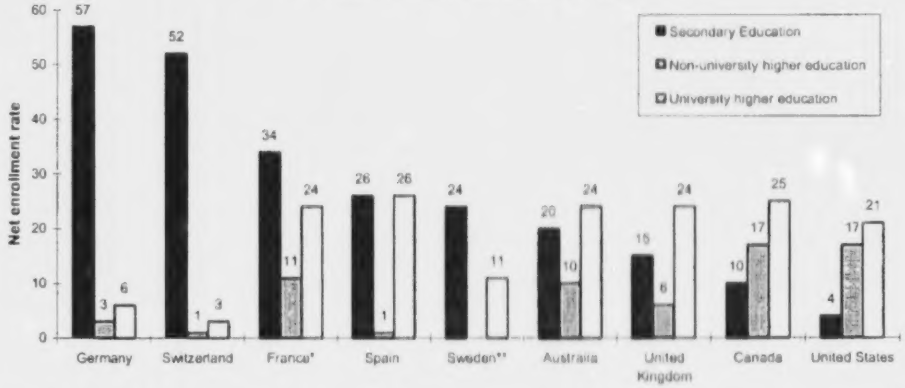


Figure 2.5: Net enrollment rates of 19-year-olds, by level of education (based on head counts) and country: 1995

* 1993 data.
** Non-university higher education data are missing for Sweden.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997.* Table C3.3. (See also Table B2.5 in Appendix B)

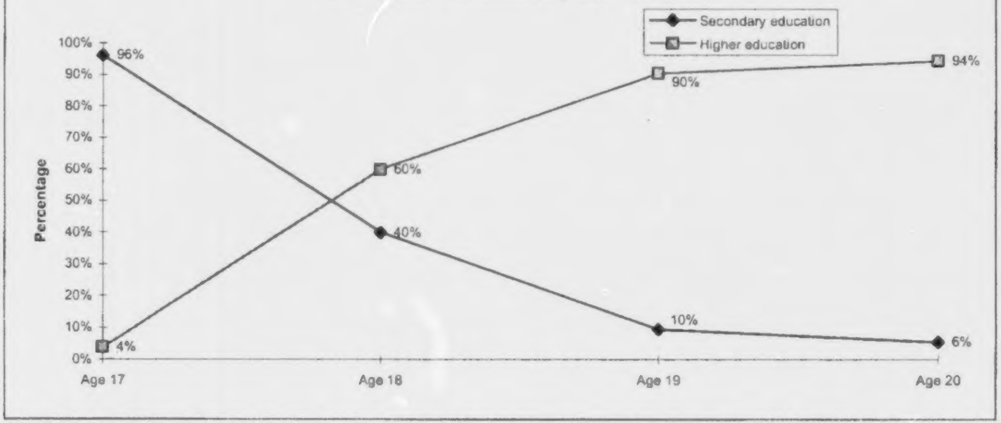
This discussion about variations in levels-of-education classification for common age groups across countries does not make all higher education comparisons across countries moot, however. The higher education classification still represents the highest level of education in each country, even if the mix of programs does not match exactly from one country to another.

Age transition characteristics

How does the transition from upper secondary education to higher education compare across countries?

In the United States, students graduate from high school, typically at 18 years of age, and many subsequently enroll in a higher education program, such as a community college or a 4-year university. For the most part, the transition between upper secondary education and higher education occurs at about the same age for most students. Figure 2.6 illustrates this relatively quick and dramatic transition between the ages of 17 and 20 for U.S. students.

Figure 2.6: Percentage distribution of U.S. students enrolled in secondary and higher education, by age: 1995

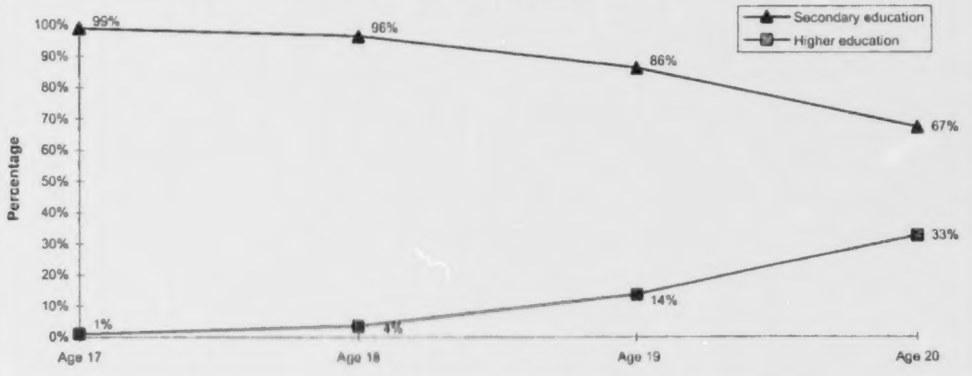


SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Derived from Table C3.3. (See also Table B2.4 in Appendix B)

In the United States, almost all 17-year-olds (96 percent) are secondary education students. However, by age 18, more than half of students are enrolled in higher education. After just one more year, at age 19, 91 percent of all enrolled U.S. students are in higher education. By age 20, approximately 95 percent of students are enrolled in higher education. The same type of quick, dramatic, and thorough transition occurs in Canada and the United Kingdom, since, by age 20, approximately three quarters of enrolled students participate in higher education in both of these countries. The transition in Australia is only slightly slower. Among the OECD countries in our group, Japan has the most abrupt transition between upper secondary and higher education—94 percent of 17-year olds are enrolled in secondary education. By age 18, the equivalent percentage drops to 2 percent. These types of age-enrollment transitions produce "scissors" patterns over the age range of 17 to 20, such as that shown in Figure 2.6.

It is less common in other European countries for students to complete secondary education and enter a higher education program at one specific age, especially in those countries with well-articulated vocational education systems and curricular tracking that occurs early in secondary school. Figure 2.7 shows the "tweezers" age-enrollment transition pattern in Germany, which also describes what occurs in Switzerland and other countries with similar educational systems. As in the United States, most 17-year-old students are enrolled in secondary education. However, unlike the United States, more than three-quarters of 18- and 19-year-old students also remain enrolled in a secondary education program. The contrast is most striking in the 20-year-old student population—in Germany, only 32 percent of 20-year-old students are enrolled in higher education, compared with 94 percent in the United States.

Figure 2.7: Percentage distribution of German students enrolled in secondary and higher education, by age: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997.* Derived from Table C3.3. (See also Table B2.4 in Appendix B)

There are several explanations for the more gradual transition pattern in Germany and other "dual system" countries. As explained earlier, the curricular tracking by school, which commences at the higher education level in the United States and Canada, begins at a lower level in dual system countries (see Figure 2.3). Once curricular tracking by school starts, students of the same age find themselves in separate programs of varying durations. A technician certificate program might last for two years, a pre-professional program for three, and an academic program for four. The age cohort gets "unsynchronized," and the age of transition up to the next level becomes staggered and less abrupt for the population as a whole. In the dual systems of Germany, Switzerland, or Sweden, vocationally specific upper secondary programs can be of a quality and rigor equivalent or superior to similar programs in proprietary schools or community colleges in the United States or Canada that are classified at the higher education level. These programs are classified as upper secondary programs in dual system countries, as one need only have a lower secondary level (i.e., junior high school) diploma to enter them.

In the U.S. education system students often remain vocationally uncommitted to at least age 18, and, for some, well beyond that. This has the advantage of allowing students to keep their options open, although, some researchers argue that some students who might like vocationally focused or hands-on coursework, tire of the general and abstract academic subjects and drop out from boredom, before they can reach a level of education where they can experience it.[60]

In contrast, in dual system countries, many students focus early on specific vocational trades. Some learn, subsequently, that they do not like their initial choice and decide to switch to another. Others wish to become skilled in more than one trade and so follow their first vocational course of study with another. Either way, through switching programs or supplementing one with another, these students' time in secondary education gets "stretched out," and the statistics show a relatively large proportion of students age 19 and above still in secondary school.[61]

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[60] See National Center on Education and the Economy, 1990.

The age enrollment transition patterns in other countries are slower than that of the United States and faster than that of Germany. In France and Spain, higher education enrollments exceed secondary education enrollments, first at age 19, and, even then, only slightly. In Sweden, higher education enrollments do not exceed secondary education enrollments until age 20. (For more on the difference between "dual" education systems and that in the United States, see the "Note on Apprenticeship" in the Technical Notes (Appendix C).)

How do the age enrollment patterns for higher education alone compare across countries?

Figure 2.8 shows age-enrollment patterns in three countries for the higher education level exclusively and over a wider age range—from 17 through 24. These three particular countries were picked because they show patterns different from each other, but representative of other countries similar to them. In Germany, there is a gradual rise in net enrollment rates by age, with no decline before the student cohort reaches its late 20s. (See Figure 2.8) Switzerland and Sweden have similar patterns.

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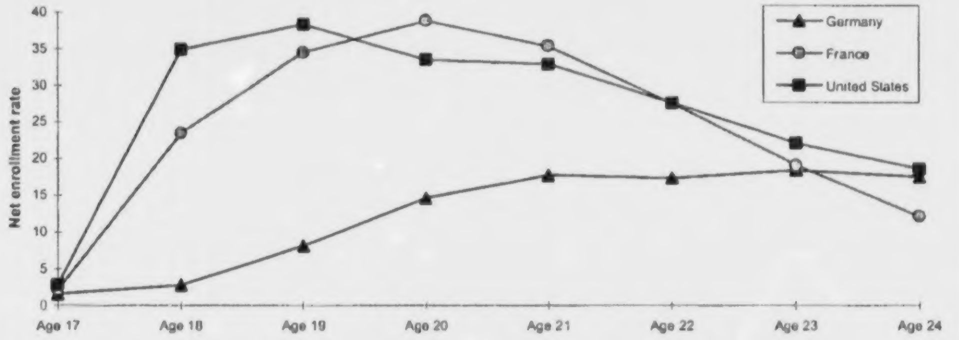
[61] Some students may also remain in secondary school beyond age 19 because the regular programs are lengthy. Occupationally-specific programs that, in the United States, one would follow through a combination of high school and community college courses are often, in other countries, set entirely inside the domain of upper secondary programs.

Figure 2.8: Net enrollment rates of students in public or private higher education in Germany, France, and the United States, by age: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Indicators of Education Systems, Comparisons of Quantitative Indicators, 8th Technical Group Meeting, 1996.* (See also Table B2.5 in Appendix B)

In France, there is a less gradual rise and a notable decline. In the United States there is an even more abrupt rise, then a gradual decline. Australia, Canada, Russia, and the United Kingdom have patterns similar to the United States'.

Gradual rises result from staggered entry points after upper secondary education, as well as from programs of differing durations. Gradual declines are due to staggered exit points from higher education and programs of differing durations. Abrupt rises, such as that occurring in the United States, and abrupt declines, result from uniform, common entry or exit points.

In the United States, most students enrolled in higher education are between the ages of 18 and 22, with enrollment dropping at a fairly gradual pace with age. Similar patterns exist in Canada and Australia. In Germany, enrollment rates in higher education increase to age 21 and then stay steady until the late 20s, when they finally decline.

Although German university students commence their program of studies at an older age than most of their counterparts in other countries, they are not "pressed" to finish quickly. In other words, their programs of study are not time delimited; students call for their final examination only when they, themselves, feel ready. Moreover, they do not pay fees, and a federal program may cover their living costs (depending upon the income of their parents), half as a grant, half as a loan. (Franckmann, p. 227)

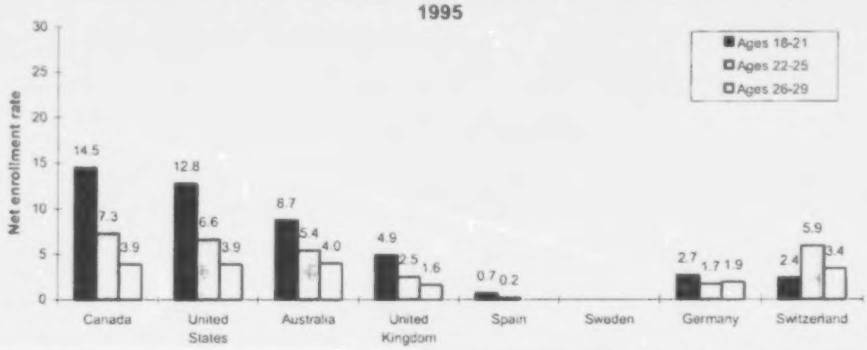
In other countries, the transition has been prolonged by a more flexible interspersion of study and work, often combining part-time study, distance learning, or "sandwich" courses. In these countries, first-time entrants to the university level are typically older and show a much wider range of entry ages. In Sweden, more than half of the student population enter university-level education for the first time after the age of 22; and less than 20 per cent of first-time entrants are younger than 20. (OECD, ***Education at a Glance, 1997***, Table C4.1).

Do age enrollment patterns differ by institution type: non-university or university higher education?

Figures 2.9 and 2.10 show net enrollment rates, by level of higher education across eight countries -- Canada, the United States, Australia, the United Kingdom, Spain, Sweden, Germany, and Switzerland – by three age groups over a wider total age span, ages 18 to 29. Given that "short cycle," non-university higher education programs tend to be briefer in duration than "long cycle" university programs, one might expect the slopes of the enrollment declines across age groups in Figure 2.9 to be steeper than those for universities in the same countries in Figure 2.10. The data tell a different story, however. First, the dual system countries of Germany, Switzerland, and Sweden do not show declines over the three age groups but, rather, a rise and then a fall over the age groups at the university level in all three countries and at the non-university level in Switzerland. Germany shows a fall and then a rise in the enrollment rate for 26 to 29 year-olds at the non-university level.

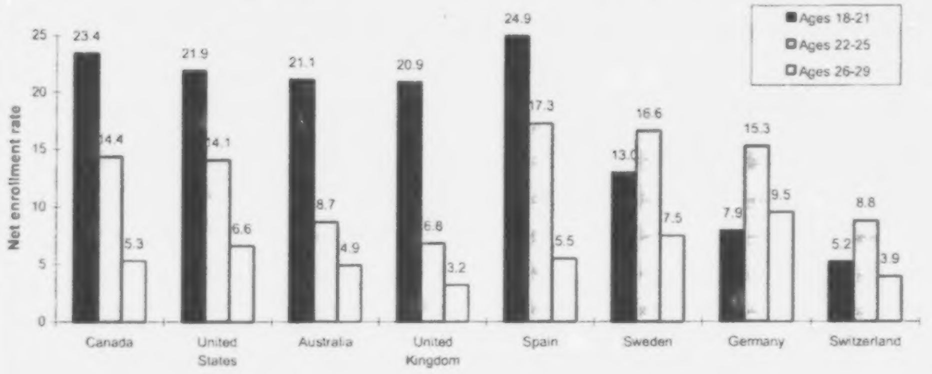
It is, perhaps, remarkable that the age enrollment patterns for the remaining five countries seem to differ little between the non-university higher education and university levels. After all, if all students entered higher education programs while in the first age group, 18 to 21, one would expect to see little enrollment in "short cycle" programs by the latter age group, since all students would have completed their programs before age 26. The fact is, however, that not all non-university higher education students enter their programs while in the youngest age group, some enter later. Indeed, a larger proportion of non-university than university students enter as "older" students, after some break away from school. So, net enrollment rates decline more gradually, as students age, in non-university institutions.

Figure 2.9: Net enrollment rate in public and private non-university higher education institutions, by age group (based on head counts) and country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C5.2b. (See also Table B2.9-10 in Appendix B)

Figure 2.10: Net enrollment rate in public and private universities, by age group (based on head counts) and country: 1995



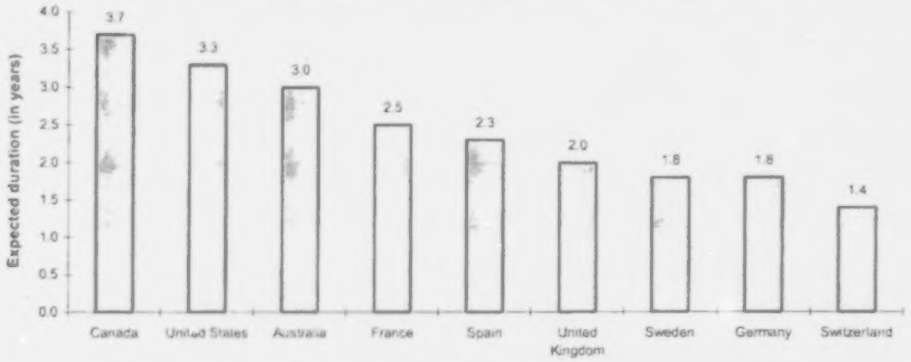
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C5.2b. (See also Table B2.9-10 in Appendix B)

How many years do students spend in higher education, on average, in different countries?

The duration of higher education programs varies across nations. In the United States, students generally attend either 2-year junior college programs or 4-year, university-level programs. In some European countries, program durations are not so standardized; there exist a variety of advanced professional, technical, or vocational institutions with programs that last varying numbers of years.

Figure 2.11 presents the average duration that a typical 17 year-old can expect in higher education, including the non-university, university, and graduate education levels. In the United States, Canada, and Australia, the average 17 year-old can expect to spend 3 or more years in a higher education program. In the United Kingdom, Spain, and France, students 17 years of age will most likely spend 2 or more years in higher education. Switzerland maintains the lowest expected higher education duration of 1.4 years. The data presented in Figure 2.11 reflects expected student time in school, rather than program length, and subsumes the expected duration-shortening effects of students who drop out of higher education programs, and 17 year-olds who never enter higher education programs in the first place. These data do not reflect any difference in expected duration, however, between those who attend school full-time or part-time.

Figure 2.11: Expected duration (in years) of enrollment in higher education for 17 year olds (based on head counts), by country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C5.1

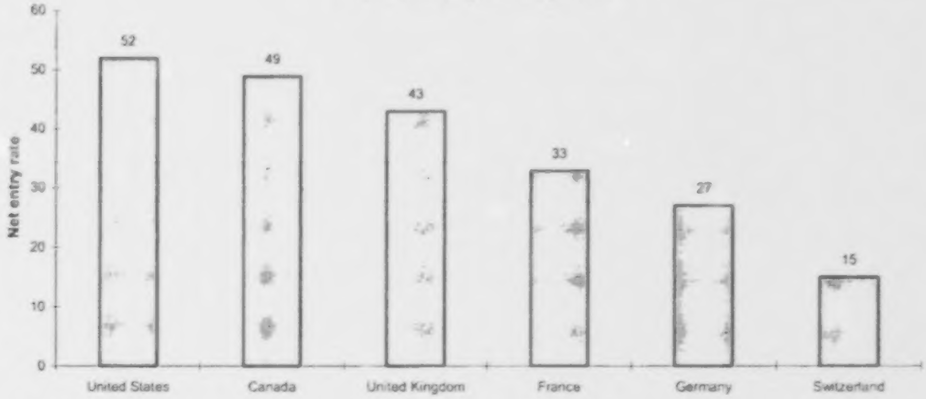
(See also Table B2.11 in Appendix B)

Student entry and re-entry into higher education

How do countries compare in terms of the percentage of "today's school-leavers" who will enter a university-level education program at some point during their lives?

Figure 2.12 shows the estimated percentage of the population aged 15 and over who will enter a *university-level* education program at some point in their lives. In the United States, just over half of the population will enter a higher education program, followed by Canada (49 percent), and the United Kingdom (43 percent). Switzerland and Germany have relatively low net entry rates, with 15 percent and 27 percent, respectively. However, both Switzerland and Germany maintain a variety of advanced vocational and technical programs, which classified as upper secondary or non-university programs.

Figure 2.12: Net entry rates for university-level education among those aged 15 and over, by country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C4.2.
(See also Table B2.12 in Appendix B)

In a later chapter, we will present completion rates for higher education programs. Keep in mind that students who are included in the entry rates shown above, may drop out of programs and re-enter at a later point in their lives. "Re-entrants" are defined as those students who return to higher education after a period of absence. The percentage of students classified as re-entrants reflects the accessibility of higher education to older students, especially those who may combine part-time study with work. Re-entrant numbers are difficult to calculate directly, however, because, theoretically, a student who drops out of a program could re-enter at any point during his or her life.

Even sufficient data needed to *estimate* the number of re-entrants to higher education are limited. In a quick survey conducted by the OECD in 1997, Canada estimated that 5 percent of higher education students were re-entrants, followed by Switzerland, with 2 percent, and Italy, with 1 percent.

Admissions practices

There are a number of ways students can enter higher education. Prospective students typically gain admission by accomplishing one or more of the following types of activities: completing secondary schooling or earning a degree or certificate from a secondary school; passing either an exit (from secondary school) or entrance (to a higher education institution) examination; taking additional class work; gaining experience in the desired area of study; or reaching other standards that are usually related to academics.

Because the systems of higher education vary both across and within countries, it is critical to recognize both variations in order to draw a more accurate picture of the process of admissions. The classification scheme in Table 2.1 delineates countries where institutions have uniform national requirements; those where institution policies vary according to regional differences; those where individual institutions have their own requirements; and those that base acceptance on program-related standards.

Table 2.1: Requirements for admission to higher education, by method and country

	Completion of secondary/degree or certificate	Upper secondary exit exam	Entrance exam	Commercial tests	Additional course work	Experience	Academic standards	Late or re-entry options for adults and dropouts
Australia	○	◆	●	●		●	◆	Yes
Canada	■	■	●	●	■			Yes
France	◆	◆	●		●		◆	Yes
Germany	○	◆	●			●		Yes
Italy	◆	◆					◆	Yes
Japan	◆	◆	◆,●					Yes
Russia	●		●				◆	Yes
Spain	◆		◆		◆		◆	
Sweden	◆	◆	●			●	◆	Yes
Switzerland	◆	●	■			○		
United Kingdom	◆	◆	●				◆	Yes
United States	◆	■	●	●			●	Yes

◆ Uniform national standard
■ Standards vary regionally
○ Standards for entry into specific higher education program
● Institution standards for entry into higher education

SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1996*, Country Profiles; International Encyclopedia of National Systems of Education, Second Edition. Oxford: Pergamon Press, 1996; Phelps, R.P. (1996). "Are U.S. Students the Most Heavily Tested on Earth?" *Education Measurement: Issues and Practice*, 15(3).

Several patterns can be observed in Table2.1. Most of the countries listed include higher education institutions that uniformly require the completion of secondary school, a degree or a certificate, the maintenance of minimum academic standards, and the availability of alternative modes of university entry for older, working adults who might not have graduated from secondary school in their youth. In addition, while most secondary school exit examinations are determined by government authorities in charge of secondary schools, at either a federal or regional level, *entrance* examinations are administered by individual institutions of higher education, or are nationally standardized tests that produce results, individual institutions may use as they wish. Furthermore, Canada, France, and Spain all require additional classes of some kind, depending upon their higher education systems.

Since there are a variety of different kinds of schools and programs within higher education in every country, not all qualifying factors apply to every student. Students wishing to enter a vocational

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program usually complete secondary level vocational schooling, earn a certificate of a particular trade, and acquire the necessary experience (e.g., from an apprenticeship or internship) to continue in the same field. In Germany, for example, post-secondary trade or technical schools are open to students who did not follow the academic track in secondary school and, instead, earned a certificate from a vocational secondary school. Germany's dual system, and several technical secondary programs normally leading to placement in an occupation, do not preclude non-academic track students the opportunity to continue into post-secondary schooling.

Academically oriented higher education institutions, including universities, professional schools, and some advanced technical schools, have somewhat similar, yet distinct requirements leading to admission. First, students must complete their secondary schooling in an academic track, or earn a certificate or degree. Second, admission often depends upon based on an entrance or exit examination, with these exams varying in level of standardization. While most entrance examinations are produced by the institutions of higher education, themselves, commercially mass-produced tests, for example, are used as standardized entrance examinations for Australia and the United States (e.g., SAT, ACT). Secondary exit examinations are standardized across countries such as France, Germany, Japan, and Italy, but are regionally based in Switzerland and Canada. Finally, particular institutions and programs may require academic records or experiences that are related to the field of desired study. Universities in some countries (Germany and Italy for instance) admit students who do not take academic track courses in their secondary schooling, however, the students' scores on their examinations must meet the academic standards of the university.

While the majority of students enter post-secondary schools in their late teens or early 20s, there are options for adults who did not complete their secondary schooling, who did not take the necessary exams for admission, or who otherwise chose not to attend. Countries either give adults the privilege to enter higher education by valuing their work experience, or classes are made available to prepare them for the required exit or entrance exams. In Japan, for example, the University Entrance Test Scheme helps adults who did not complete their upper-secondary school courses. German adults can attend the *Abendgymnasium*, evening school, to prepare for the Abitur.

Ease of access to higher education

The ease of the admissions process into higher education varies across countries, making it difficult to compare accessibility at a national level. While acceptance rates may be calculated at each institution (in the United States, the acceptance rate – the number of accepted applicants divided by the total number of applicants – is commonly called the "yield"), they are normally not considered matters of national policy and would be difficult to calculate in the aggregate. For instance, it would be nearly impossible to calculate an acceptance rate for the United States. Since prospective students typically apply to more than one institution, adding up all institutions' acceptance rates would produce a meaningless number – the number of applicants would be several times the real number, with the number who apply but do not enroll impossible to calculate. Other available information for individual countries (such as the number of requirements needed, the level of enrollment in typical higher education age cohorts, and related anecdotes) provide the best insight available.

Entrance to some institutions across countries has been traditionally more competitive because of government grant money provided for students through the institution, or for reasons of prestige or the popularity of particular programs. Universities in Australia determine entry by the number of places funded by the government and they are fiercely competitive because of students' desire to attain the most prestigious degree. In Sweden, higher education traditionally has been under tight government control, and student places have been allocated based on estimates of future labor market demands. (Kogan, pp. 151-152)

Large increases in applications to higher education in recent years have led some institutions that used to accept an unlimited number of individuals to assess the scores on exit and entrance examinations, and academic records, as well. Many Italian universities, for example, now base acceptance on applicants' academic records and *Maturita* and entrance examination scores.

It is easier to understand the process of admissions in higher education institutions compared to specific programs of study. In recent years, trends in the economy have led students to apply for programs that are based in business and other professional and technical fields. While true for all countries, the trend has been most dramatic in Russia, with more and more student interest in capitalist economics and business management. (World Bank, p. xxii) Some higher education authorities have met these demands by establishing more professional and technical schools, rather than by trying to prod traditional universities to add such programs—or else they have made existing professional programs more competitive through restrictions.

To illustrate the above, significant numbers of students in France have applied to accounting programs in their vocational/professional schools. Since those institutions do not have enough space, restrictions on the number admitted have been put in place. The excess students have, subsequently, enrolled in traditional university programs in which they did not originally desire to study. France has open admissions and guarantees a place in higher education for any students passing the BAC (the academic-track "high school" exit exam), but there are no guarantees of a place in one's chosen area of study. The most popular programs can select the students they want. Currently the preparatory programs (CPGE) are most popular in the *grand écoles*, the graduate-level professional schools, and most advanced technical training programs (STS or IUTs). They may be found as separate programs within universities or in freestanding institutions. (Leroux, pp. 117-126)

Other countries make entry into higher education, particularly universities, very difficult in order to ensure that their prospective students are serious and dedicated. Russian entrance examinations, for instance, can be administered by each individual department or faculty within a higher education institution. Moreover, Russian universities purposely schedule all entrance exams on about the same date. Hence, if students do not get into a program after completing an exam, they are left without an option for admittance into another program that school year; rejected students have to wait until the following year to retake an examination.

Though students in Japan or Germany may take standardized national examinations for university entry (the National Center for University Entrance Examinations Test in Japan and the *Abitur* in Germany), prestigious institutions in both countries also administer their own entrance examinations, thus forcing students who wish to create options for themselves (and include entry into the prestigious institutions among them) to sit for several examinations.

Another effective method for controlling entry that does not involve rejecting students' applications is charging student fees. One finds a wide variety, across and within OECD countries, in student financial obligations. Some countries, such as Spain, Japan, and the United States, have a long tradition of student fee paying; for other countries, charging fees and providing loans are strange new activities.

Where higher education has been provided free of charge to students, the number of years of instruction required to produce one graduate has tended to be higher than in systems and institutions where students have met at least part of the costs themselves. This is accentuated where universities receive resources on the basis of the number of students enrolled, because, then, the universities have a positive incentive to retain registered students as long as possible. It is sometimes suggested that this is the case in Italy, Germany, and other Western European countries. (Williams, pp. 47-48)

Currently, there is an almost full spectrum of national examples of student financial obligations toward their own higher education. In Germany, it is zero. In Japan, loans are available to help cover the fees of only a small number of students. In the United States, there is a wide variety of financial aid possibilities for covering student tuition and fees. In the United Kingdom, loans are available to help with living expenses, only (fees for courses are subsidized 100 percent by the government). In Australia, loan repayments are linked closely to levels of income.

The only model that no longer exists as a universal national policy is that which was previously widespread in Eastern Europe and used in Great Britain. In that model, students received free higher education and a generous "salary" sufficient to cover all living costs (and then some) while studying. (Williams, pp. 49-50) European taxpayers funded these types of student careers both through complete endowments of university operations and grants for student living expenses, so long as the students were not yet ready to complete their work. Over time, however, taxpayers grew stingy, particularly as the ranks of students in higher education grew.

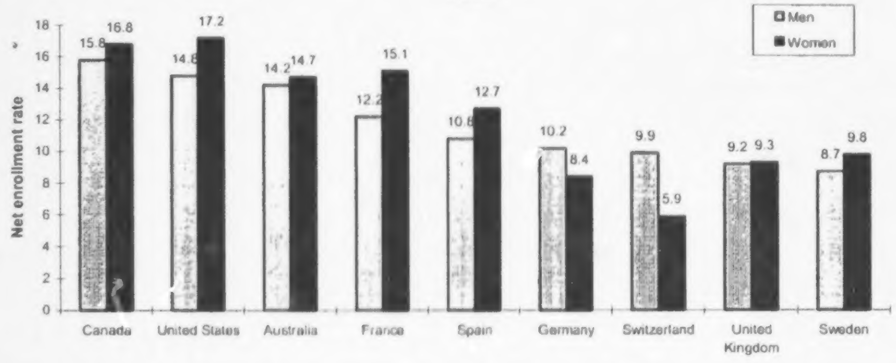
Composition of the higher education student population

The participation of female students

As participation in higher education increases across countries, it is replacing secondary education as the means of securing the skills and training necessary for well-paid employment. An advanced degree can open more doors to professional offices and advanced scientific and technical laboratories than can an upper secondary degree. Access to higher education, then, has profound political, economic, and social implications for women.

As Figure 2.13 shows, women comprised the majority of higher education enrollments in most countries in our group – Canada, the United States, Australia, France, Spain, Sweden, and the United Kingdom. Women comprised the minority in Germany and Switzerland.

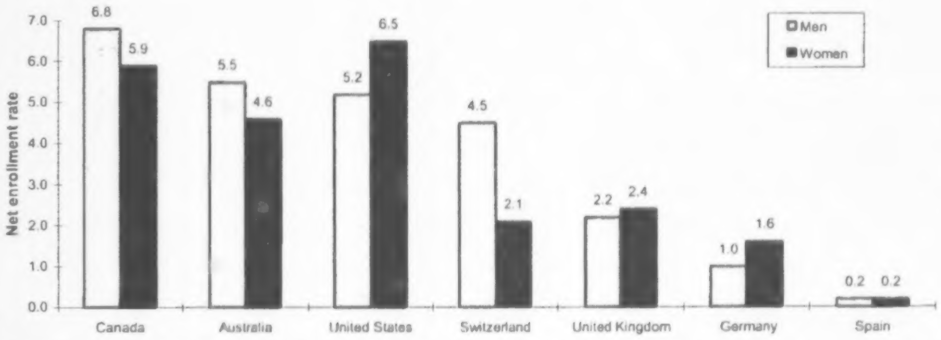
Figure 2.13: Net enrollment rate in public and private higher education for persons 17 to 34 years of age, by sex (based on head counts) and country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C5.2a. (See also Table B2.13-15 in Appendix B)

In only the United States and France (using 1994 data for France) does the women's majority hold up at both the non-university and university levels. (See Figures 2.14 and 2.15) In Australia and Canada, men are the majority in non-university higher education; in Spain, men's and women's enrollment levels are equal at that level. In the United Kingdom, men are the majority at the university level. Sweden does not break out its enrollment data by both gender and level.

Figure 2.14: Net enrollment rate in non-university higher education for persons 17 to 34 years of age (based on head counts), by sex and country: 1995

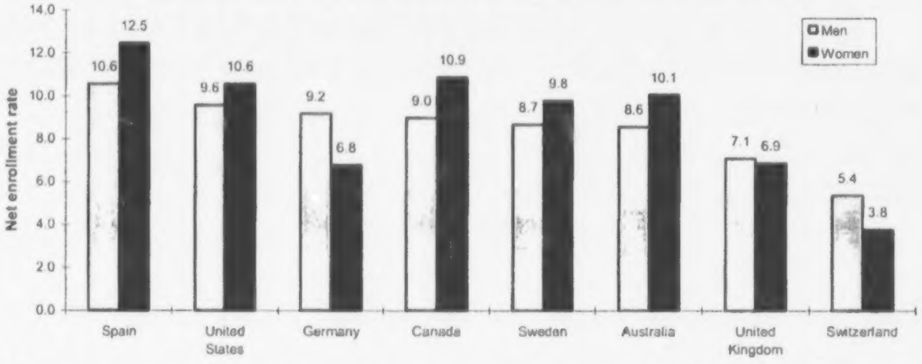


SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C5.2a.

(See also Table B2.13-15 in Appendix B)

While men comprise the majority in higher education in both Switzerland and Germany, they are the minority in non-university higher education in Germany. More detailed Swiss and German data reveal women's majorities among "older" secondary education students in their late teens or early 20s. Some occupational training traditionally popular among women, classified as secondary education in Germany and Switzerland, is classified as higher education in other countries.

Figure 2.15: Net enrollment rate in universities for persons 17 to 34 years of age. by sex and country (based on head counts) and country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Table C5.2a. (See also Table B2.13-15 in Appendix B)

Simply because women represent a majority of higher education students in most countries in our group does not necessarily mean they have achieved equality of opportunity. They may still be more likely to pursue degrees in fields that are less remunerative than others. Chapter 4 contains an analysis of field of postsecondary study by gender.

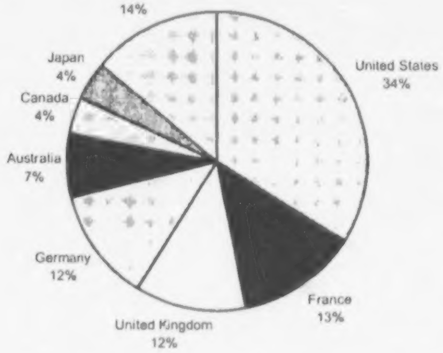
Foreign students

Higher education enrollment is not always constrained by political boundaries, nor has it ever been. The philosopher and logician, William of Ockham, Martin Luther's mentor, studied at both Paris and Oxford in the 15th century before teaching in Germany. (Perkin, pp. 172, 176) The international migration of higher education students has become more common in recent years, however. Both the supply of and demand for places in higher education institutions have grown while improvements in transportation and communication have made migration easier. Furthermore, post-World War II efforts at building international institutional connections have included many programs that encourage professional and student "exchanges" across countries.

In the United States alone, foreign student enrollment increased 1,200 percent between 1954 and 1995, from below 50,000 students to over 450,000. Nine of the top ten countries of origin in the 1995-96 academic year were Asian. Canada was sixth. (Davis, p. vii)

The countries in our focus group enrolled the vast majority of all foreign students in all OECD countries in 1995. (See Figure 2.16) The United States, for instance, received the most foreign students in absolute numbers, with 34 percent of the total. France (13 percent), Germany and the United Kingdom (12 percent each), Australia (7 percent), and Canada and Japan (4 percent each) follow. This group of receiving countries accounted for nearly 85 per cent of all foreign students studying in OECD countries.

Figure 2.16: Distribution of foreign students among OECD countries, by host country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997.*

Chart C6.1. (See also Table B2.16 in Appendix B)

For potential student migrants, one of the more important factors in selecting a destination country may be the availability of a familiar language of instruction. As the English-speaking world is the largest language group in the OECD, students in the United States, the United Kingdom, Canada, and Australia have more choices of courses in other countries that are taught in their home language, probably making migration easier for them.

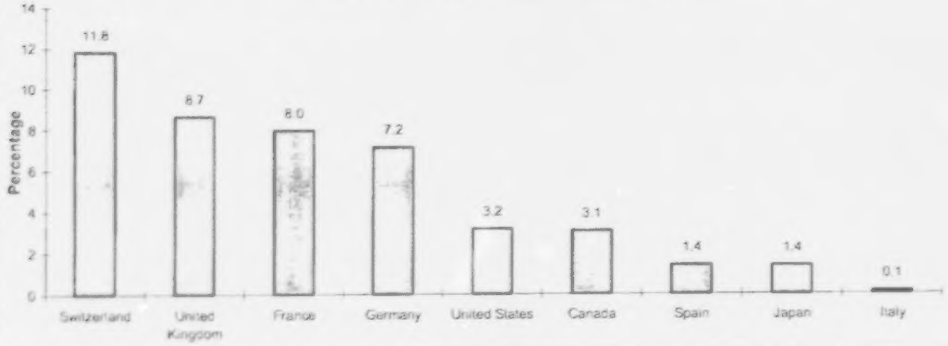
Indeed, there are many "push" and "pull" factors that may explain patterns of student mobility: language barriers, academic reputations of institutions or programs, flexibility and prominence of "study abroad" programs, and admission policies, along with geographical and historical links between countries, the location of potential future job opportunities, cultural aspirations, and policies for credit transfer between home and host universities.

What proportion of each country's higher education enrollment do foreign students comprise?

Our focus group of countries attracted foreign students from around the world; over half of foreign students in these countries were from non-OECD countries. Japanese and Koreans comprised the largest proportions of foreign students from OECD countries, while students from China and Southeast Asia comprised the largest proportions of foreign students from non-OECD countries. The Asian continent represented the largest source of foreign students, Europe the second largest.

The percentage of foreign students enrolled in our focus countries ranged from nearly 12 per cent to less than one per cent (See Figure 2.17). Switzerland received the largest proportion of foreign students, 11.8 per cent of their higher education enrollment, followed by the United Kingdom, France, and Germany. In contrast, Spain, Japan, and Italy reported the smallest proportions of foreign students in their higher education enrollments, less than 1.5 percent of their higher education enrollments.

Figure 2.17: Percentage of higher education students enrolled who are not citizens of the country of study, by country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*. Derived from Table C6.5. (See also Table B2.17 in Appendix B)

What proportion of each country's native higher education student population studies abroad?

The proportion of each country's native student population who study in other OECD countries varied in 1995. Less than 1 percent of the native higher education student population from Australia, the United States, or the Russian Federation enrolled in other countries, less than 2 percent from Canada, Japan, France, Germany, Italy, Spain, and the United Kingdom. Switzerland sent the largest proportion to other countries, 5 percent, while Sweden sent 3.5 percent

This measure, however, used only counts of foreign students in OECD countries. Thus, the proportion of students from OECD countries who studied abroad is underestimated, because some of them studied in non-OECD countries. Moreover, foreign students are counted only if they enroll abroad for at least a full academic year; student who study abroad for less than a full year are not included in this measure. Fifty-three percent of students from the United States who studied abroad, for example, are not included in this measure.

It is probable that the European countries of our focus group will experience an even higher rate of student mobility in the near future. Since 1994, the European Union (EU) has reorganized and extended the scope of academic exchange programs. The Socrates Program, for example, is designed specifically to allow European students to study in higher education institutions throughout Europe and easily transfer academic credits across borders. Though the EU has not yet passed the specific legislation, its open labor market, uniform currency (the Euro), and open borders are already easing student mobility across Europe. (Tsaoussis, pp. 171-173; de l'Ain, pp. 85-102)

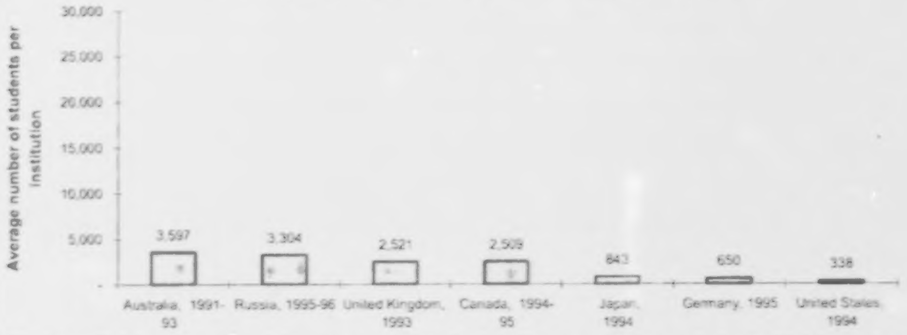
Number of institutions and average institution size

An important factor that helps countries determine the allocation of resources for higher education is average institution size. A nation or state may have a large number of institutions and a small average institution size because of a dispersed population, or because of some other, deliberate policy. Schooling could be compartmentalized by level (e.g., "short cycle" and "long cycle" institutions) or by curricular theme (e.g., general arts and sciences, vocational, technical, professional). These levels and themes may be separated by institution, or they may be combined. The more they are kept separate, the greater the number of individual institutions and the smaller the average institution size.

We have obtained data for the number of institutions and their overall enrollment for each of the countries that formulate the focus group, except for Switzerland. Some of the countries, Spain and Italy in particular, have very few, if any, non-university institutions and were, consequently, not included in calculations for that level of education. In general, the group of countries illustrate how U.S. institution size compares. Figures for the number of institutions by category come from each country's own education statistics publications. Some of the difficulties in developing reliable measures on average institution size are described in the "Note on the number and size of institutions" in the Technical Notes (Appendix C).

Figure 2.18 shows, of the ten countries in the comparison group included in various years between 1991 and 1996, the average number of students per non-university higher education institution in the United States (338) was smaller than in all other countries included here: Germany (650), Japan (843), Canada (2,509), United Kingdom (2,521), the Russian Federation (3,304), and Australia (3,597). (See Technical Notes (Appendix C) for more information.)

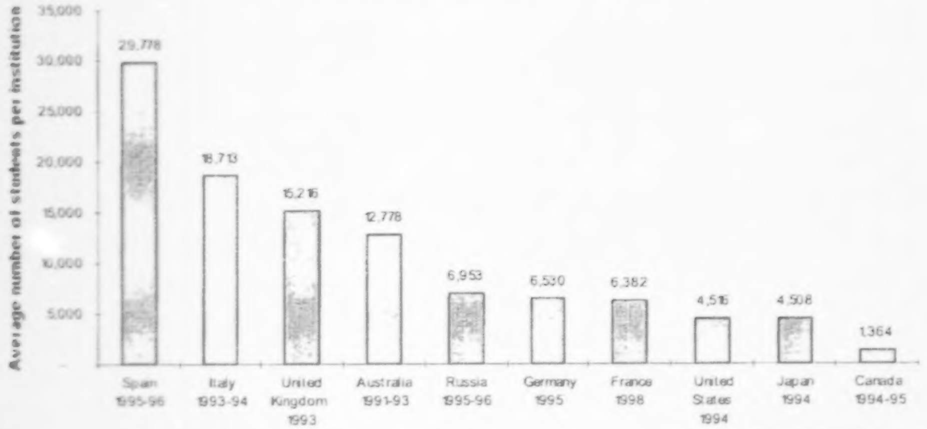
Figure 2.18: Average number of students enrolled per institution of non-university higher education, by country: various years



SOURCE: Various country sources. See Technical Notes (Appendix C) for a listing. (See also Table B2.18-19 in Appendix B)

Figure 2.19 shows a similar pattern at the university level for our focus group of countries. The average number of students per university-level institution in the United States (4,516) was greater only than that of Canada (1,364) and Japan (4,508), while less than those of France (6,382), Germany (6,530), Russia (6,953), Australia (12,778), the United Kingdom (15,216), Italy (18,713), and Spain (29,778).

Figure 2.19: Average number of students enrolled per institution of university higher education, by country: various years



SOURCE: Various country sources. See Technical Notes (Appendix C) for a listing. (See also Table B2.18-19 in Appendix B)

Given the differences in purpose, goals, and student populations between university and non-university higher education, it is understandable that universities would be larger, on average, than non-university higher education institutions. Comparing Figures 2.18 and 2.19, one can see that in every country with numbers for both levels of higher education, except Canada, universities were, on average, larger than non-university institutions.

Summary

Most countries in our focus group enrolled between 8 and 11 percent of their population aged 5 to 29 years in higher education in 1995, double the enrollment rates of just 20 years ago. The 1995 rates ranged from 7 percent in Switzerland to 15 percent or more in the United States, Australia, and Canada.

Enrollment rates in higher education vary across countries for several reasons. In some countries, for example, student tenure in elementary and secondary education lasts longer than it does in others, which leads to "delayed" entry into higher education. The more years spent in schools classified as "secondary" and the fewer years spent in institutions classified as "higher education," the lower the enrollment rates for "higher education."

"Dual system" countries, such as Switzerland and Germany, and any country where students are encouraged to make broad occupational/curricular choices early in life, tend to exhibit some "prolonged" student careers, much of them classified at the upper secondary level. Substantial numbers of youth in these countries may pursue upper secondary credentials into their 20s because they changed their minds about their occupational direction while in their teens (which forced them into some curricular retracking), they now desire more than one occupational credential, or the credentials they seek take a relatively long time to obtain, comparable to a combination of both a high school and a community college program in the United States.

These different curricular alignments can, in turn, produce different age-transition patterns between secondary and higher education, from country to country. In the United States and other predominantly "general education" countries, the "switch" can be rather abrupt – with over 90 percent of 17-year old students in secondary school and over 90 percent of 19-year old students in higher education. In dual system countries, such as Germany and Switzerland, the age-transition pattern between the two levels of education is more gradual, with over 50 percent of 20-year old students still in programs classified as secondary.

Although they are fewer in number and enter at an older age, German and Swiss university students are well provided for by the state and tend to "prolong" their higher education studies into their late 20s. While 1995 U.S. higher education age-enrollment rates crested at age 19, and the French rates at age 20, the German rates crested at age 23. The "expected duration" in higher education for the average 17-year old is lower in Germany and Switzerland than it is in the "general education" countries and France, only because Germany has fewer higher education students per capita. The few they have tend to stay longer. (de l'Ain, pp.86-91; Williams, pp. 47-50)

The variation in higher education enrollment rates results, in part, naturally from coincident variation in admissions practices. Admissions policies are multifaceted and difficult to summarize across countries. Some are more rigorous than others and most involve tests, either secondary-level exit exams, or higher-education-level entrance exams. Nonetheless, the most important factor in determining the ease of access to higher education may be the number of available places. In countries where government still provides all of them, there often are not enough to meet demand.

Though it may no longer be "news," it must, by historical standards, still be considered a remarkable achievement that in 1995, the majority of higher education students in most countries were women. Indeed, women comprised the majority of the student body in all of our countries, except Switzerland and Germany, the two dual-system countries.

Due to a variety of factors facilitating higher education enrollment abroad in recent decades, as well as the substantial growth in the supply of and demand for places in higher education institutions at the same time, the number of foreign students enrolled has grown enormously. The United States alone has experienced a 1,200 percent increase in foreign student enrollment in 40 years.

CHAPTER 3
RESOURCES AND EXPENDITURES

CHAPTER 3

RESOURCES AND EXPENDITURES

Education is an investment in human knowledge and skills that can help foster economic growth and enhance productivity, contribute to personal and social development, and reduce social inequality. Like any investment, it involves both costs and benefits.

Financial support for education can be viewed from several different perspectives. Total expenditure on education merely determines who spends the largest sum of money on education, but is misleading when comparing small countries to larger ones, for a small country may spend less in the aggregate, but more per student. Student-adjusted finance data also presents some limitations. A poorer country may spend as much per student as a richer country, by making a greater fiscal effort to educate its citizens; however, that would not be apparent by looking only at aggregate spending or per-student spending.

Because there is no single measure of public financial support which tells a comprehensive story for education, several are presented here. A "Note on expenditure comparisons" is included in Appendix C: Technical notes, that provides background information on the calculation or derivation of the measures.

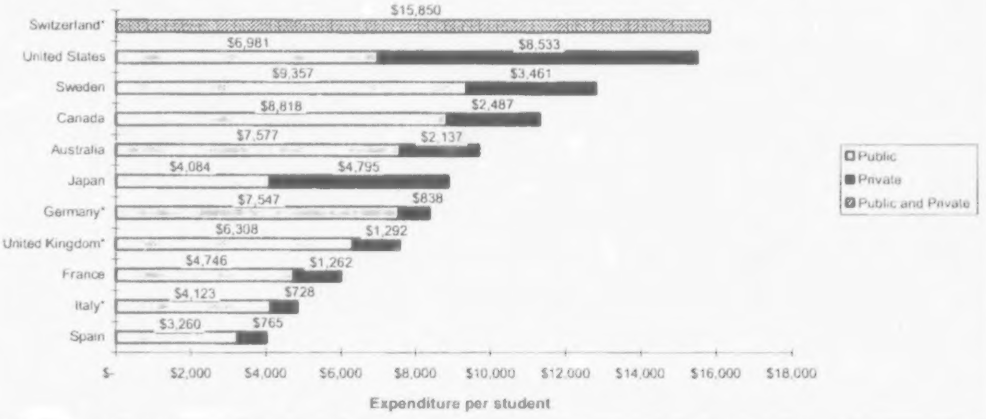
Financial resources and expenditures

How does the level of higher education spending compare across countries? Which countries provide the most for their students and which provide the least?

International comparisons of education funding are necessarily complex. Countries vary dramatically in their structures for providing support for their higher education institutions, and funding levels reflect divergent structures and policies regarding education institutions. Moreover, one can measure higher education spending several different ways, each of which has advantages and disadvantages as an explanatory device. For example, higher education expenditure, either just from public sources, or combined with private revenues, can be calculated per GDP, as a proportion of public expenditure, per student, or in various other ways.

One of the most often used measures is higher education expenditure per student which, in this case, uses numbers that have been converted into U.S. dollar amounts, with a purchasing power parity index (Figure 3.1). The purchasing power parity (PPP) index contains rates of currency conversion that eliminate differences in price levels among countries. This means that a given sum of money when converted into different currencies at the PPP rates, will buy the same basket of goods and services in all countries. Thus, when expenditure on GDP for different countries is converted into a common currency by means of PPPs, it is, in effect, expressed from a common set of international prices.

Figure 3.1: Expenditure per student (U.S. dollars converted using PPPs) on higher education institutions, by source of funds and country: 1994



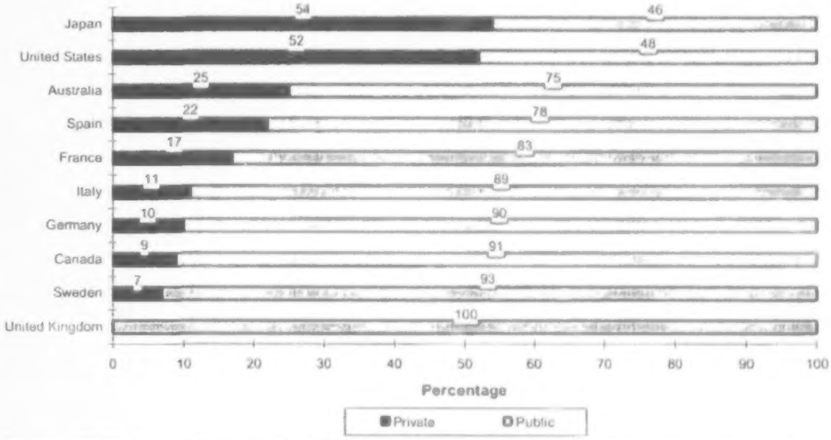
* Public (or public and "government-dependent" private) institutions only.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Derived from Table B1.1c and B4.1. (See also Tables B3.1 and B3.3 in Appendix B)

Figure 3.1 shows that more money was spent on each higher education student in Switzerland or the United States than in the other countries in our group. (Unfortunately, the Swiss data are not broken out by public and private sources.) In Switzerland and the United States, more than $15,000 was spent per student, whereas in the majority of the countries in our group, expenditures per student did not reach $10,000. U.S. spending per higher education student was almost four times that of Spain's, three times that of Italy's, and double what it was in France or the United Kingdom.

The United States did not rank high in our group of countries on the expenditure per student measure, however, if one counted only that proportion of expenditures emanating from public sources. The United States ranked second only in *total* expenditure per student, incorporating money from both public and private sources. Comparing expenditure per student by considering only public sources, the United States ranked below Sweden, Canada, Australia, and Germany.

In Figure 3.2, our group of countries is ranked in order of the *proportion* of higher education spending that originates from private sources which include: direct purchases made by students or their families as tuition, fees, or room and board bills; private scholarships from charities or foundations; and direct subsidies to institutions from private (or non-profit) organizations. Even expenditures made at publicly run higher education institutions may emanate from both public and private sources as the institutions may be subsidized by government, but still charge tuition and fees and room and board. Likewise, expenditures made at privately-run higher education institutions may emanate from both public and private sources. Students may pay part of their tuition and fees directly, and the rest through government-subsidized loans and grants.

Figure 3.2: Percentage of expenditure on higher education institutions from public and private sources, by country: 1994

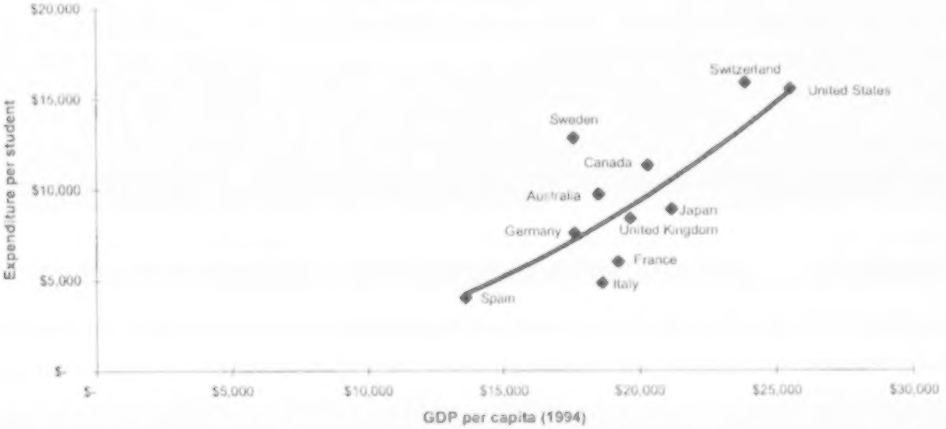


SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B2.3. (See also Table B3.2 in Appendix B)

How much do countries spend on higher education, given resources available?

A country with a larger pool of resources naturally has a larger amount available to spend on higher education. Indeed, as one can see in Figure 3.3, there seems to be a fairly linear relationship between the wealth of a society, as represented statistically (if a bit imperfectly) by gross domestic product (GDP) per capita, and total higher education spending per student. Gross domestic product is the sum of all the goods and services sold in a year within a country, and it represents the size of a nation's economy.

Figure 3.3: Expenditure per student (U.S. dollars converted using PPPs) on public and private higher education institutions in relation to GDP per capita, by country: 1994

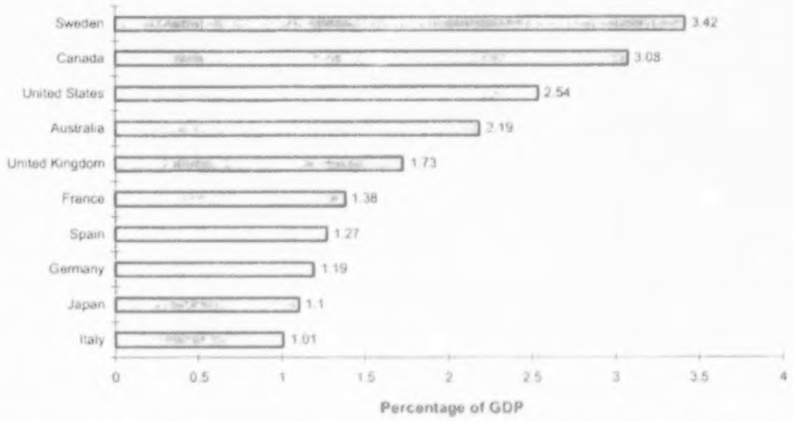


SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B4.1 and X2.1. (See also Table B3.3 in Appendix B)

All else held equal, richer countries spent more on each higher education student in 1994 than did poorer countries, just as one would expect. Countries above the average line spent more on higher education students, given their level of resources, than the countries below the line. No distinction is made here according to the initial source of expenditure; both public and private sources are included. If this scatterplot were redrawn such that only expenditure from public sources were included, the markers for Japan and the United States would be only half as high and each found well below the average line. That's because almost half of higher education spending in those countries originates from private sources.

Figure 3.4 below presents education spending as a ratio of total higher education expenditures and gross domestic product (times 100) for each country in our focus group. After expenditure per student, this measure—expenditure per GDP—is probably the next most popular indicator of education spending. Whereas the United States ranked 2nd of 11 countries on the former measure, it ranked 3rd of 10 countries on higher education expenditure relative to GDP. Switzerland, the highest-ranking country on expenditure per student, is not included in the expenditure per GDP calculation, for lack of sufficient data.

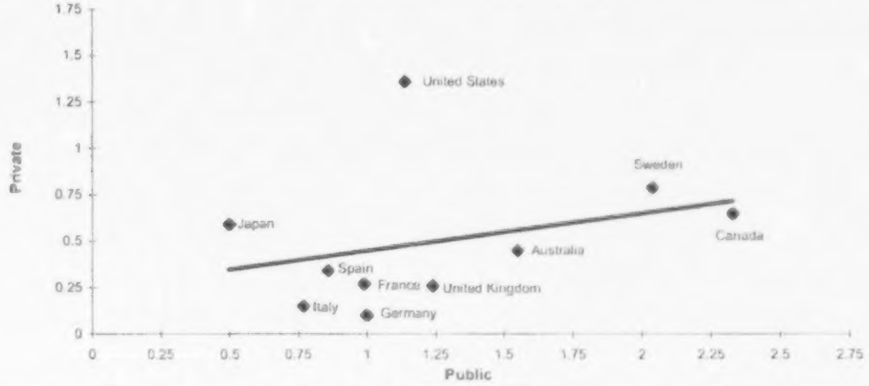
Figure 3.4: Higher education expenditure as a percentage of GDP*, by country: 1994



* Higher education expenditures include all expenditures on public and private educational institutions, plus financial aid to students and private payments other than to educational institutions.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B1.1c (See also Table B3.3 in Appendix B)

Figure 3.5 below breaks out public and private expenditure per GDP by initial source of funds. Some might argue that the extent to which a society is willing to subsidize higher education, often referred to as "fiscal effort," is best represented by the amount of *public* funds dedicated to the effort. If so, the countries making the greatest fiscal effort are oriented to the right of Figure 3.5. Canada and Sweden appear to be the societies within our group of countries most generous with public funds to their higher education system. Countries with the largest private expenditure can be found in the upper part of the figure.

Figure 3.5: Higher education expenditure as a percentage of GDP*, by intial source of funds and country: 1994



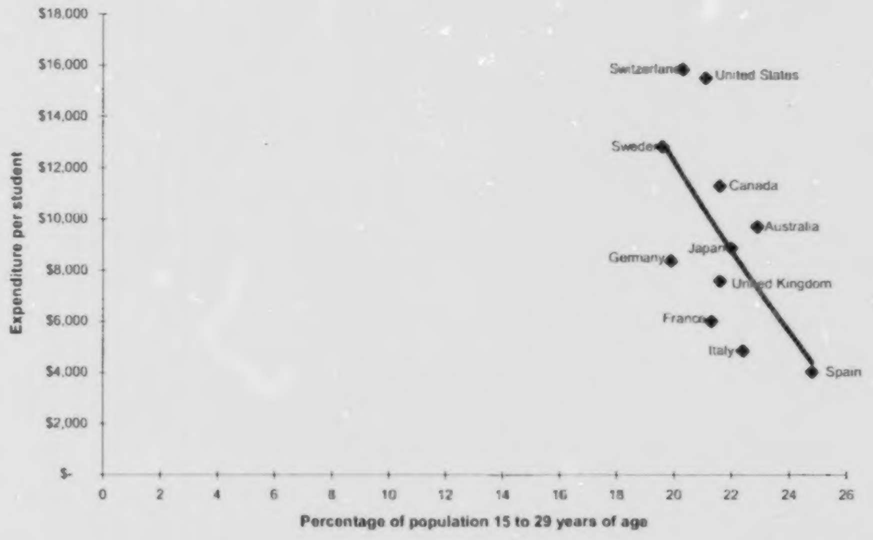
* Higher education expenditures include all expenditures on educational institutions, plus financial aid to students and private payments other than to educational institutions.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B1.1c. (See also Table B3.2 in Appendix B)

Given who benefits from higher education, some economists argue that it is most fair to have higher education students, themselves, pay part of the bill (through direct purchase or loan repayment), and society pay the rest. After a student graduates and starts applying what she learned in the workplace, both the former student and society benefit. The graduate benefits by gaining a larger paycheck than was possible with a lower level of educational attainment. Society benefits because that higher level of skill is employed in the economy. The proportions of the higher education bill that are proper for the student and for society each to pay, however, are open to debate, and different countries have reached different decisions.

In some OECD countries (e.g., Italy and Germany), virtually all higher education spending comes from the "public till." When the individuals who induce the spending differ from the individuals providing the resources, the dynamics of "the market" can become confusing. Those running higher education institutions may feel less incentive to control spending, if they benefit mightily (in salary and prestige) from the spending while making only a tiny proportion of the sacrifice themselves (through a relatively small proportion of their individual taxes). Students, moreover, may feel little incentive to finish their studies quickly, if all fees (and even room and board in some countries) are provided for them. Conversely, taxpayers may feel little incentive to fund higher education to the "optimal level" that would be good for society as a whole, if no one in their family is or is considering attending a higher education institution.

Another critical determinant of the demand for higher education spending is the proportion of the population in the typical age cohort for higher education. As one might expect looking at Figure 3.6, countries with a larger proportion of citizens in the cohort ages 15 to 29 usually spent less *per student* than countries with a smaller proportion of their population in this age cohort. If there are relatively more students in relation to the size of the population as a whole, less can be afforded for each.

Figure 3.6: Higher education expenditure per student in relation to the percentage of population 15 to 29 years of age, by country: 1994



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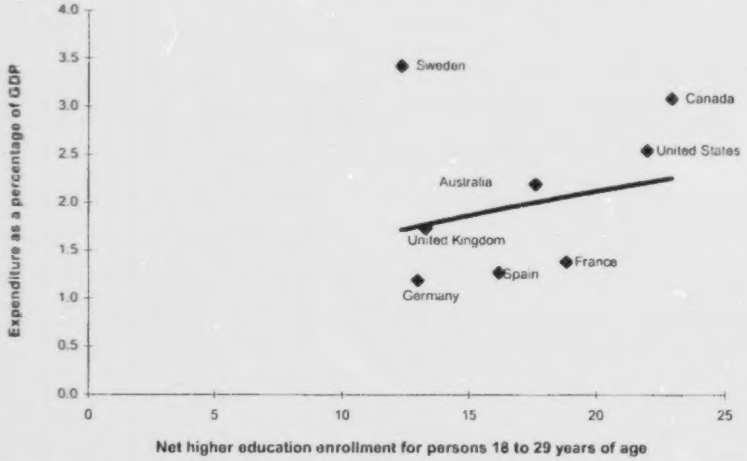
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table A1.1 and B4.1. (See also Tables B3.1 and B3.4 in Appendix B)

One would expect, however, that countries with larger proportions of a typical higher education age cohort enrolled would spend a larger proportion of their GDP on higher education, all other factors held equal. More students need more money. As illustrated in Figure 3.7, countries with lower enrollment rates spent a smaller proportion of their GDP on higher education; countries with higher enrollment rates spent a larger proportion of their GDP on higher education.

Figure 3.7: Higher education expenditure as a percentage of GDP in relation to the net higher education enrollment for persons 18 to 29 years of age, by country: 1994-95



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B1.1c and C5.2b. (See also Tables B3.3 and B3.11 in Appendix B)

Largely due to the influence of Sweden, however, the relationship does not appear to be particularly strong. Sweden is an outlier in several respects, as it had the smallest proportion of the population aged 15 to 29 and the smallest net higher education enrollment rate, but the highest expenditure on higher education as a proportion of GDP.

Allocation of financial resources and expenditures

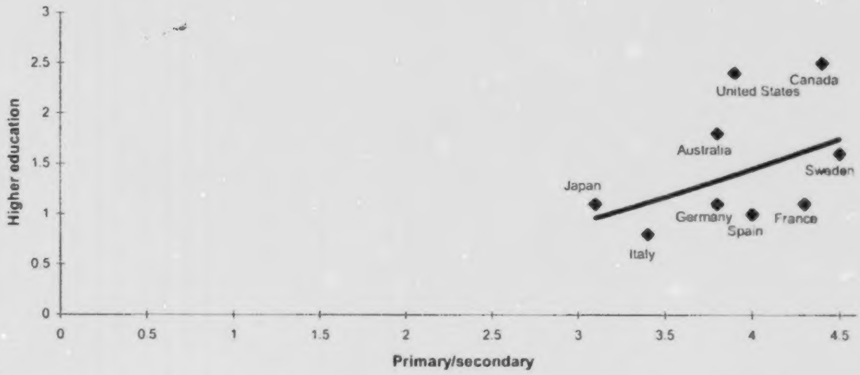
How are education expenditures distributed across levels of higher education?

Any expenditure decision involves "tradeoffs." That it is true for individuals who decide between paying tuition to a higher education institution to attain a higher level of education and working full-time; and it is true for governments that decide to invest public money in education subsidies, instead of in highway maintenance, health centers in poor communities, foreign aid, tax reduction, and so on.

The axiom above is also true for policy decisions *within* the education domain. The taxpayers, government executives, legislators, and education ministry officials must choose among the different aspects of the education enterprise.

Figure 3.8 illustrates the tradeoffs made by each country between primary and secondary education and higher education. There appears to be a positive correlation across countries in the relative distribution of resources between the two levels of education. The countries with a higher level of spending on education overall, as measured by the proportion of their GDP devoted to education, tended to spend more on both levels of education. Those countries, such as Canada, Sweden, and the United States, are oriented toward the upper right of the figure. The countries with a lower level of spending on education overall tended to spend less on both levels of education. These countries, such as Japan and Italy, are oriented toward the lower left of the figure.

Figure 3.8: Expenditure from public and private sources on educational institutions as a percentage of GDP, by level of education and country: 1994

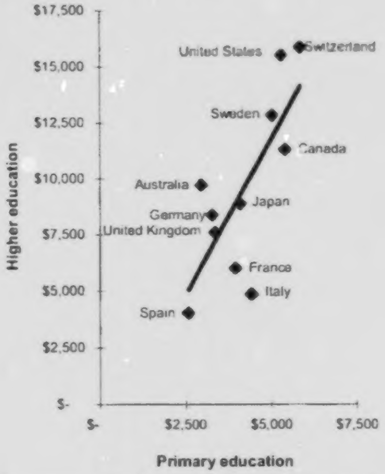


SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B1.1d. (See also Table B3.5 in Appendix B)

This figure, however, includes all education spending, from both public and private source. If only public-sourced expenditures were included, the markers for Japan and the United States would drop halfway down the figure and move slightly to the left, putting them in line with most of the other countries. That is because private spending represents a large portion of education spending in Japan and the United States, more than half at the higher education level in each country, and far less at the primary and secondary level.

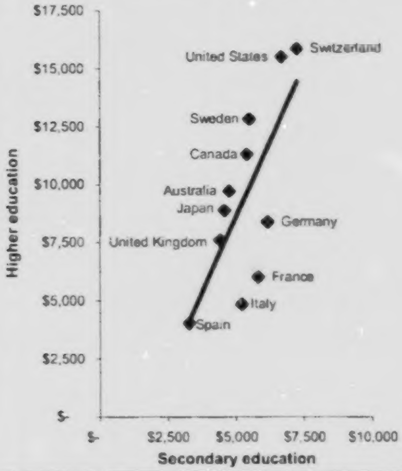
Figures 3.9 and 3.10 illustrate relationships similar to that in Figure 3.8. There appears to be a positive relationship across countries in terms of the distribution of expenses per student between levels of education. Countries with a higher level of spending on education, as measured by the average expenditure per student overall, tended to spend more on students at all levels of education. Those countries, such as Switzerland, Sweden, and the United States, are oriented toward the upper right of the figures. The countries with a lower level of spending on education overall tended to spend less per student at all levels of education. Those countries, such as Spain and Italy, are oriented toward the lower left of the figures.

Figure 3.9: Expenditure per student (U.S. dollars converted using PPPs) on public and private institutions, by level of education and country: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B4.1 (See also Table B3.1 in Appendix B)

Figure 3.10: Expenditure per student (U.S. dollars converted using PPPs) on public and private institutions, by level of education and country: 1994



SOURCE: Organisation for Economic Co-operation and Development, ***Education at a Glance: OECD Indicators, 1997***, Table B4.1. (See also Table B3.1 in Appendix B)

While all of our selected countries spent a higher proportion of their GDP at the primary-

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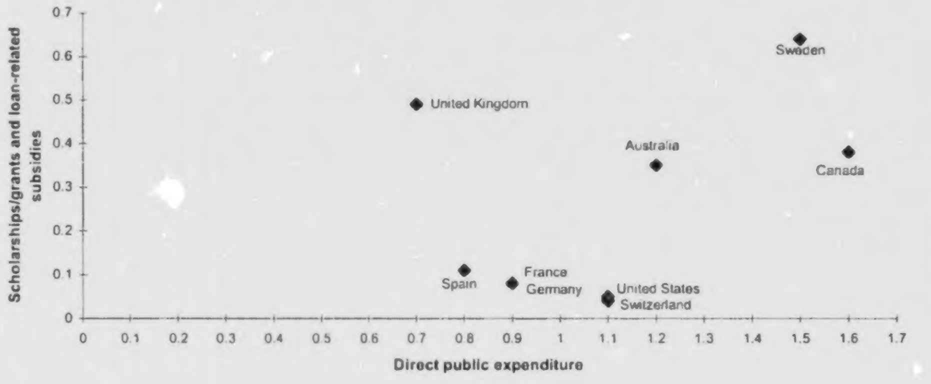
secondary level (Figure 3.8), all did not spend more *per student* at the primary-secondary level. Indeed, with only one exception among all the countries for which sufficient data were available, average expenditure per student was higher for higher education than for secondary or primary education. Italy provided the only exception, with a higher average expenditure per pupil at the secondary level than at the higher education level.

How are public higher education expenditures distributed between institutional and household spenders?

Public money can be channeled to higher education in a variety of ways. Two of the more obvious methods are: directly to the higher education institutions; and directly to the households with students. The difference might seem subtle, since, in the end, the money will be spent at the institution anyway. In the United States, where substantial amounts of money are provided by the federal and state governments for student grants and subsidized loans, that money is channeled directly from the government to the institutions. Each U.S. student applies for the grant or loan directly from the federal government or indirectly through a private bank. Each U.S. grant or loan recipient can attend virtually any higher education institution he or she chooses. But, the grant or loan payment is wired directly from the government or bank to the higher education institution.

As a result, the United States' marker appears near the bottom in Figure 3.11, which breaks public education expenditure into its two different possible routes of transit -- direct to the institutions, or in scholarships/grants or loan-related subsidies that go first to students or their households. The United Kingdom stands out for channeling almost half of its higher education expenditure through individuals and households. Sweden and Canada channel a substantial proportion of their public expenditures – a fourth or more -- via the same route. For the other countries in our group, the overwhelming majority of public money went direct to higher education institutions.

Figure 3.11: Higher education expenditure as a percentage of GDP, by source of funds and country: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B1.1c and B3.1b. (See also Tables B3.3 and B3.6 in Appendix B)

Annual public subsidies to households can arrive in several forms, the combination of which varies greatly across countries. Tax reductions, scholarships or grants, loan subsidies or guarantees, and family and child allowances account for some of the more popular forms. Though it does not provide precise measurement of the size of the financial aid given to higher education students from country to country, Table 3.1 is, perhaps, thorough enough to illustrate the variety and character of typical financial aid programs across countries.

Table 3.1: Components of financial aid in the G-7 countries: Early 1996

	Australia	France	Germany	Japan	United Kingdom	United States
Grants for Living expenses	Limited	Limited	Yes	Limited	Yes	Yes
Loans (by)	Government agency	Banks	Government	Government (very limited)	Government	Banks and Government
Fees	Yes; option to pay after graduation	Very low	No	Yes	FT students; no PT students; yes	Yes
Average percentage of students receiving support towards living costs and for fees	40-50	20	25	20	60	30-50
Tax concessions and/or family allowances	No	Family allowance	Family allowance	Tax concession	Family allowance	Tax concession
Medical	National Health Insurance	National Health Insurance	Extra allowance	None	National Health Insurance	None
Travel	Extra allowance	Taken into account in level of aid	None	None	Extra allowance	None
***Other indirect aid**	No	Yes	Yes	No	No	Some

* Other Indirect Aid is publicly subsidized provision of non-educational services such as accommodation and meals.
SOURCES: OECD Reports; Japan: "Private Funding Versus Government Funding in Japanese Universities", unpublished paper by Mashteru Baba, Shinshu University.

How are public education resources and expenditures distributed across levels of government?

Public resources are not always retrieved from "one big pot." They may emanate from a variety of fund-raising mechanisms – different types of taxes and transfers. Transfers take place when one type or level of government gives some amount of money to another type or level of government. A small amount of funds may be transferred from one state to another when a student attends a university in another state that has a reciprocal student exchange relationship. Very large amounts of funds are sometimes transferred between levels of government in countries wherein more than one level of government contributes resources to higher education, but the administration of higher

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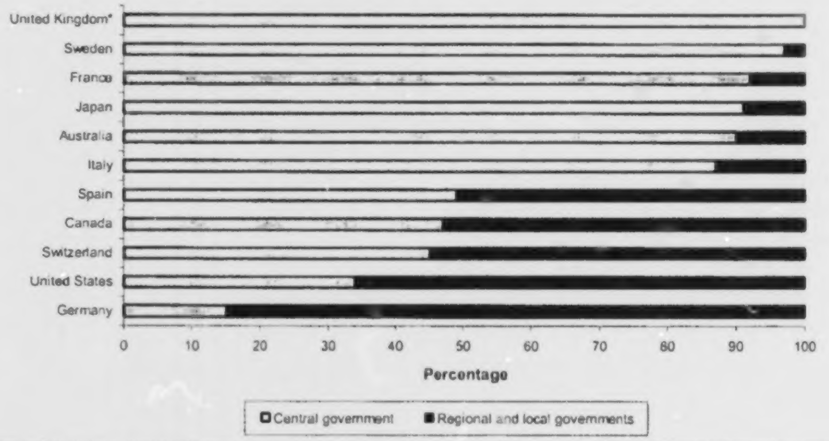
education is the primary responsibility of only one.

Figure 3.12 shows the distribution across levels of government of public resources devoted to higher education. The "initial source of funds" is the level of government that generates the resources, usually through taxation. The figure shows substantial variety across our group of countries in the distribution between central (i.e., national or federal) governments, on the one hand, regional (i.e., state, provincial, cantonal, and so on), and local governments, on the other hand. The percentage of resources raised by the central government ranged from less than 15 percent in Germany to more than 95 percent in Sweden. Five of the 11 countries raised less than 50 percent of public higher education resources at the national level; the other 6 countries raised more than 50 percent of public higher education resources at the national level.

Figure 3.12: Percentage of public expenditures on higher education institutions initially from the central government, by country: 1994

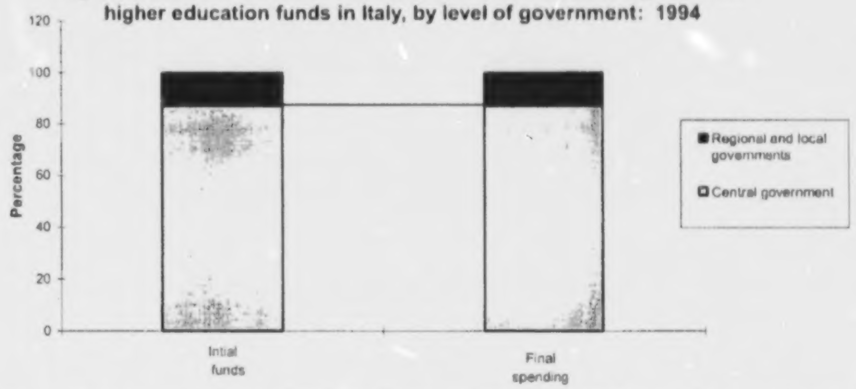


* 1993 data.

SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B6.1b (See also Table B3.7 in Appendix B)

In Sweden, France, Japan, and Italy, public higher education is mostly an administrative responsibility of the central governments. Figure 3.13 illustrates, for Italy, the distribution across levels of government of revenues, on the left, and of expenditures, on the right. There's no change; for the most part, the national government gets the money and the national government spends the money.

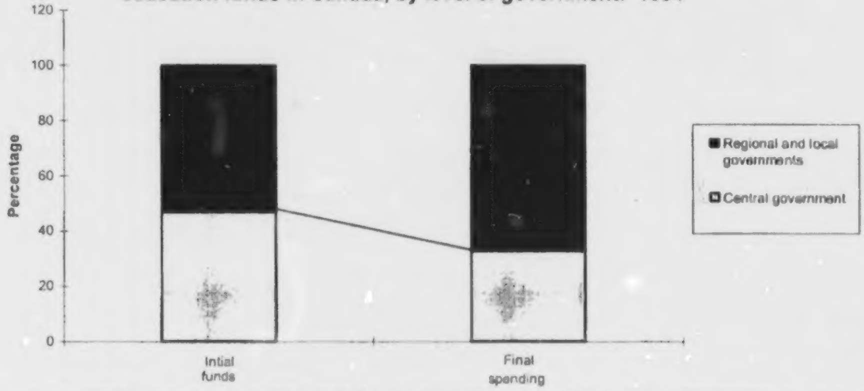
Figure 3.13: Path between initial sources and final spending of public higher education funds in Italy, by level of government: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B6.1b. (See also Table B3.7 in Appendix B)

By contrast, in the four countries in our group deriving the greatest proportion of revenues through regional or local governments – Canada, Switzerland, the United States, and Germany -- the distribution across levels of government was different for revenues than for expenditures. Each of these countries has a long-standing federal system of governance. In each of these countries, the federal government raises more money than it spends. Conversely, the regional and local governments spend more money than they raise. Some money is transferred from the federal to the regional governments. Canada illustrates this situation in Figure 3.14.

Figure 3.14: Path between initial sources and final spending of public higher education funds in Canada, by level of government: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B6.1b. (See also Table B3.7 in Appendix B)

Australia and Spain represent situations that lie between the two illustrated by Italy and Canada. Australia has a federal system, and the proportion of spending made by the federal government was 4 percentage points less than the proportion of revenue it raised. However, the federal proportion of spending is, nonetheless, 86 percent on the same scale as that found in countries with central government control over higher education. Spain is in the process of "devolving" from a system with central government control over higher education into one wherein it is administered regionally. Currently, about half of Spain's public higher education is administered centrally, and about half is administered by the "autonomous communities" the Spanish states.

The pie charts in Figure 3.15 illustrate three distinct possibilities for the distribution across levels of government of final purchases (after transfers between levels of government) made with public resources for higher education. The chart for France describes a situation where in central government control predominates over regional control. Charts for Italy, Sweden, and Japan would look much the same. France does have regional authorities involved in the administration of public higher education (as does Sweden and Japan), but the "purse strings" are drawn in Paris.

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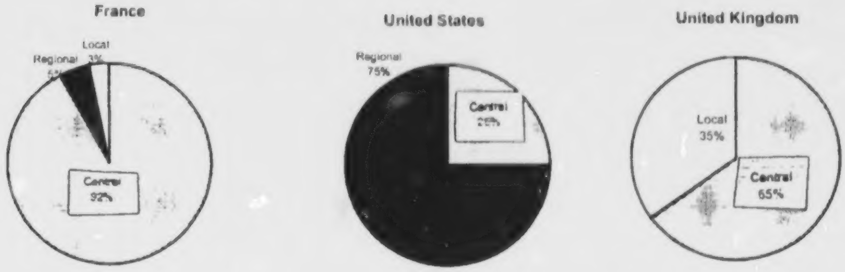
Figure 3.15: Distribution of final purchases of public higher education resources in France, United States, and United Kingdom, by level of government: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B6.1b. (See also Table B3.7 in Appendix B)

Though the U.S. federal government raised 34 percent of public revenue for higher education in the United States, it directly spent only 25 percent of what it raised. Much of that was in the form of grants and subsidized loans, which have universal requirements for students attending virtually any institution they please; so few "strings are attached" to the federal spending. In the United States and the other countries with federal systems, such as Germany, Switzerland, and Canada, the federal and regional governments have made accommodations, dividing some responsibilities here, sharing some responsibilities there. In the four countries, however, most public administrative authority in higher education, as well as most control over spending public money on higher education, rests with the regional governments.

The United Kingdom, the third pie chart, above, has a somewhat different system. All public revenue for higher education is raised by the central government, but 35 percent of it is spent by higher education authorities in local higher education districts. These districts do not necessarily correspond administratively or geographically with other non-education-related governmental authorities, as they have a substantial degree of autonomy in their spending decisions (even though they have no responsibility for raising the revenues they spend).

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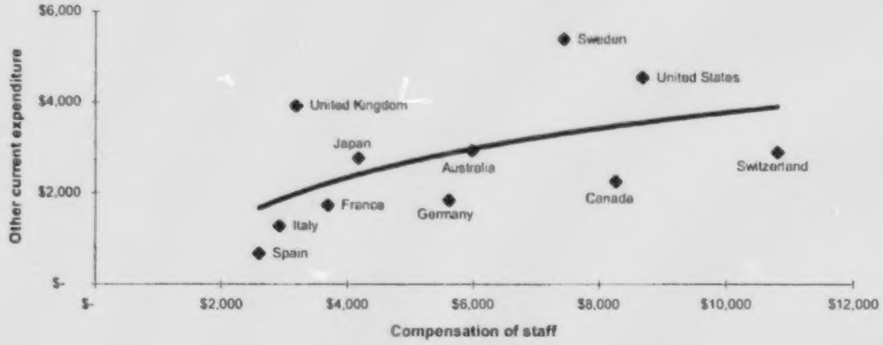
How are higher education expenditures distributed between staff compensation and other current expenditures?

In Figures 3.16 and 3.17, current expenditure, which is total expenditure minus spending for construction, large or durable equipment, and debt service, is itself subdivided into two smaller categories of expenditure – compensation of staff (i.e., salaries and benefits) and other current expenditure. Given this subdivision, other current expenditures are likely to represent administrative overhead expenses predominantly. The salaries and benefits paid to administrators, however, would be classified as staff compensation.

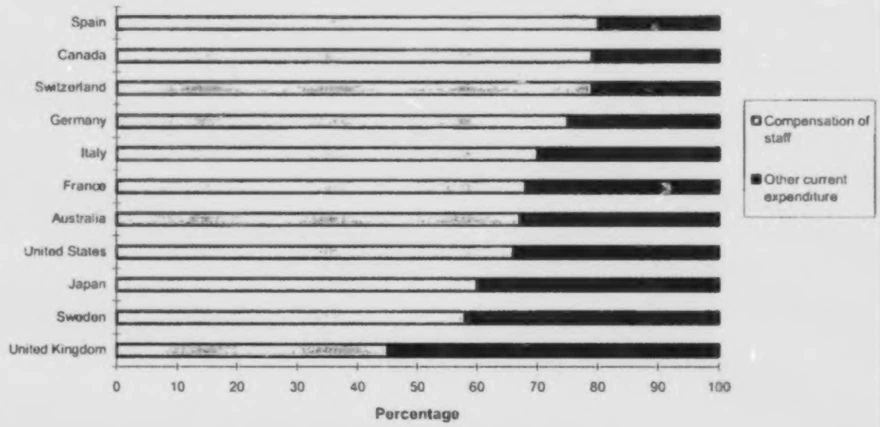
Figure 3.16: Average current expenditure per student (in equivalent U.S. dollars) on public and private higher education institutions, by type of current expenditure and country: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B5.1b. (See also Table B3.8 in Appendix B)

Nonetheless, some might argue that the real work of education is done with people, not equipment (except in laboratories and on computers and blackboards), nor office supplies, nor athletic facilities, nor beautiful campus grounds. The more money that goes directly to those doing the work of education, the better for the students.[62] Much of "overhead" expenditure, however, is necessary expenditure, such as heating, building maintenance, and the processing of enrollment and financial records. Indeed, others might argue that the most efficient higher education systems are those that have learned best how to automate or substitute lower-paid staff for routine tasks formerly done by relatively more expensive professors in traditionally-run university systems.

Figure 3.17: Percentage of current expenditure on public and private higher education institutions, by type of expenditure and country: 1994



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B5.1b. (See also Table B3.8 in Appendix B)

Human resources

In addition to financial resources, the intangible qualities of dedicated teachers are of utmost importance in any educational setting. A large proportion of a labor force employed in education reflects an extensive education system. Countries vary, however, in the degree to which social and other non-instructional services are provided directly by higher education institutions. In the United

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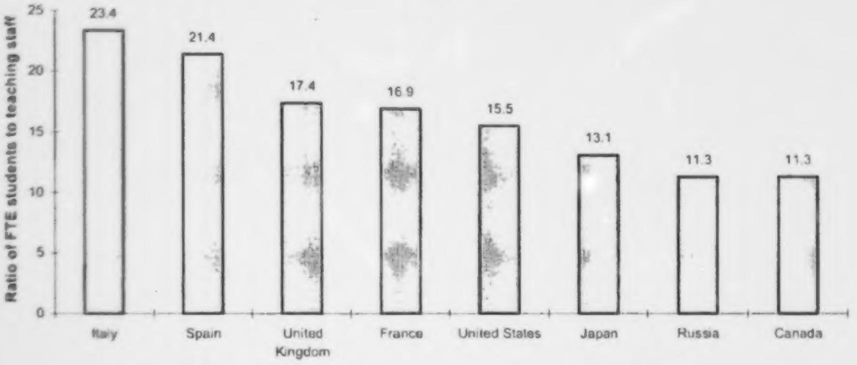
[62] Ideally, we would have liked to contrast compensation of *teaching* staff with all other current expenditures, but too many countries lacked data precise enough for that task.

States, higher education institutions typically employ staff to operate student health center, dormitories, cafeterias, intercollegiate sports facilities, and other auxiliary services not commonly found in higher education institutions in other countries. In other countries, many or all of these services are either provided by non-education public authorities or by the private sector. Simple comparisons of staffing levels in higher education across countries, then, can suggest misleading comparisons of the levels of *instructional* staffing.

Even simple comparisons of *teaching* staff levels across countries can mask important differences in the quality and experience of instructors. The use of graduate student instructors to teach lower-level university courses, for example, is not as common in other countries as it is in the United States. Moreover, the amount of time teaching staff devote to teaching can vary from country to country, and even within countries. Teachers in higher education allocate their time to a variety of activities that can be classified in three categories: classroom instruction; activities that support instruction, such as tutoring or grading papers; and activities that do not directly support instruction, such as research or administration. International statistics are not precise enough to measure the true allocation of instructional staff time across those three categories, however.

Figure 3.18 displays the ratio of students to teaching staff across countries in higher education. Italy and Spain show the largest student/teacher ratios by comparison with the other countries presented, twice the ratios of Canada and Russia. Other factors being equal, the lower the student-teacher ratio, the greater the likelihood that each student will receive some individual attention from faculty. Likewise, the lower the ratio, the less likely those faculty are to be overstressed by their teaching responsibilities, leaving more time to manage interactions with students at a high level of quality, or engage in research or administrative activities.

Figure 3.18: Ratio of students to teaching staff (both measured in full-time equivalents) in public and private higher education institutions, by country: 1995



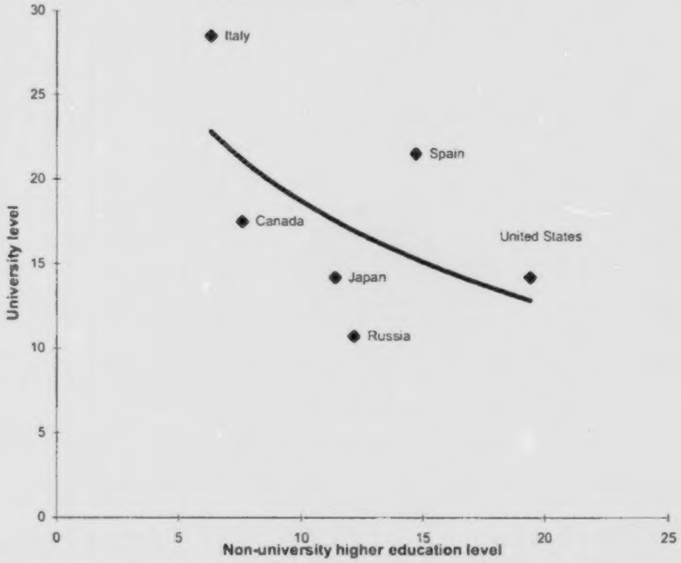
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B8.3. (See also Table B3.9 in Appendix B)

Student/teacher ratio, however, is not the same as class size. It is possible for a country to have a low student/teacher ratio with a large class size if teachers spend little of their time in the classroom. However, if the average proportion of teacher time spent in the classroom was equal across countries, one would expect to find smaller class sizes in countries with smaller student/teacher ratios.

Higher education institutions can be publicly or privately governed or of different levels of education (university versus non-university). When comparing the student/teacher ratios between public and private higher education institutions, then some differences between the selected countries become apparent. Japan, for example, had a lower student-teacher ratio in public higher education institutions. Conversely, Canada, the United States, and France had lower teacher/student ratios in private higher education institutions. These differences may, in part, be determined according to the sector (public or private) in which the country's elite higher education institutions reside. Some public higher education institutions in Japan, and private institutions in France and the United States, maintain rigorous standards for admission, carry a great amount of prestige, charge tuition, and offer lower student/teacher ratios as a perquisite.

While universities and non-university higher education institutions may be differentiated by type of study (general academic versus vocational-professional), differences in their student/teacher ratios can also be substantial. Italy's university student/teacher ratio, for example, was several times greater than the student/teacher ratio in its non-university higher education institutions in 1995. In 4 of the 6 countries for which complete data were available, the student/teacher ratio was higher at the university level than at the non-university higher education level, as can be seen in Figure 3.19.

Figure 3.19: Ratio of students to teaching staff (both measured in full-time equivalents) in public and private higher education institutions, by level of education and country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table 8.3. (See also Table B3.9 in Appendix B)

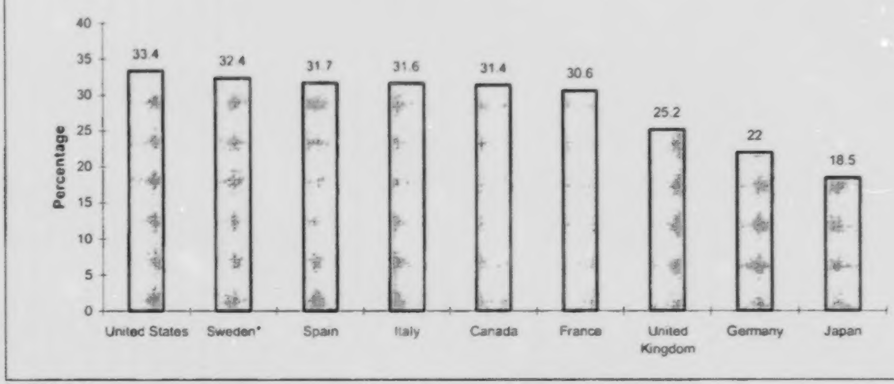
Only the United States and the Russian Federation had higher student/teacher ratios at non-university higher education institutions than at universities and, in Russia, the difference was marginal. In the United States, non-university higher education institutions (e.g., community colleges) can have smaller or larger *class sizes* than universities depending on the particular program and a variety of other factors. The primary reason that *student/teacher ratios* were, on average, higher at U.S. non-university higher education institutions, is probably that teachers in U.S. community colleges, on average, spend more time in the classroom than do university professors. University professors are often allotted work time out of the classroom, to tend to research or administrative responsibilities.

The massification of higher education has, perhaps, affected student/teacher ratios at both levels across countries, however. Universities cannot always afford the luxury of smaller classes and must teach more students in larger class settings. While the demand for places in professional schools has increased (and most non-university institutions in countries other than the United States are vocationally focused), it is not always possible to accommodate with larger classes, given the apparent necessity for smaller student/teacher ratios when teaching technical, "hands-on" skills and supervising apprentices.

How prominent are women in higher education faculty?

While the majority of *students* across countries in higher education were women in 1995, the majority of *faculty* were not. Women represented a minority of full-time and part-time faculty in every country in our group. Moreover, there existed notable differences across countries in the proportion of teaching staff that was female. Figure 3.20 shows that women represented a little over 30 percent of full-time teaching staff in the United States, Sweden, Spain, Italy, Canada, and France. In Japan, Germany, and the United Kingdom, less than 30 percent of the full-time teaching staff were female.

Figure 3.20: Percentage of women among full-time teaching staff in higher education, by country: 1995



* 1994 data.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B7.2. (See also Table B3.11 in Appendix B)

Women were better represented among part-time teachers than full-time teachers across our group of countries. In each country, the proportion of part-time faculty that was female either equaled or exceeded the proportion of full-time faculty that was female.

Other gender differences can be found by comparing teaching staff at the elementary, secondary and higher education levels of education. There was a higher proportion of female teachers at the elementary and secondary level in every country than there was at the higher education level. Female teachers at the elementary and secondary level represented more than 60 percent of full-time teaching staff. Thus, the proportion of women among teaching staff in higher education seems to have been half or less than that found at the elementary and secondary level.

Summary

Expenditure per student is the measurement most often used to compare education spending across countries, as is the most direct measure of the amount of resources applied to the number of students in each country. The average expenditure per student in the United States was high; more than twice as high as that in Italy, France, or the United Kingdom and is second only to that in Switzerland. However, a substantial proportion (more than half) of U.S. expenditure emanated from private source. Comparing expenditures per student by considering only the proportion originally from public sources, the United States ranked only 5th out of 10 countries.

Another popular measure, education expenditure per GDP, compares countries' spending relative to their wealth, as measured by the value of the total output of goods and services. As one would expect, countries with larger GDPs per capita tended to have higher levels of expenditure per student. Again, the United States ranked high on higher education expenditure per GDP when both public- and private- sourced expenditures were included. Counting only public-sourced expenditures, however, the U.S. again fell into the middle of the pack, fifth among ten countries.

Any expenditure involves tradeoffs. Hence, how expenditures are allocated among competing priorities can be as revealing as levels of expenditures. In the tradeoff between levels of education, the United States leaned more heavily in the balance than any other country toward higher education as measured by higher education expenditure per GDP. This may be because the United States had a larger proportion of its population participating in higher education than did most countries. Moreover, a substantial proportion of higher education expenditures in the United States emanated from private sources. Comparisons based solely on public-sourced expenditures would place the United States in the middle of our group of countries.

Looking at tradeoffs just among public expenditures, the United States transferred less higher education money directly to households or students and more directly to institutions than any other country in our group, other than Switzerland. Choosing between expenditures on staff compensation, or other expenditures, the United States ranked 2nd of 11 countries, on each.

One must always keep in mind that comparing *human* resource allocations across countries can be tricky. The U.S. did not have a relatively high student/teacher ratio considering higher education as a whole, ranking fifth among eight countries. The student to teacher ratio at the non-university higher education level, however, was higher in the U.S. than in all five other countries with data sufficient for the comparison, but relatively low at the university level, tied for fourth among six countries.

Finally, the United States had a larger percentage of women faculty among full-time teaching staff in higher education than any other country in our group, with over 33 percent. None countries ranged in their percent female among full-time faculty from 18 in Japan to 33 in the United States. Five countries--Sweden, Spain, Italy, Canada, and France—had full-time female faculty of about 31 or 32 percent.

CHAPTER 4
HIGHER EDUCATION OUTCOMES

CHAPTER 4

HIGHER EDUCATION OUTCOMES

The previous two chapters of this report examined higher education system "inputs" for our group of nations, including the participation of students in higher education and the contribution of financial and staff resources. This chapter considers higher education "outcomes" of students, which reflect the success of each country in preparing students for full participation in society and in the workplace. Outcome measures in this chapter include: students graduating from higher education programs; the distribution of higher education degrees awarded among different fields of study; the relationship between educational attainment and labor market success and literacy skills; and the intergenerational effect of parents' educational attainment on their children's achievement in mathematics and science and their children's own educational attainment.

Policy makers are interested in outcome indicators for several reasons. First, outcomes provide important information on the state of students' and adults' current achievement and skill levels. If students have high achievement and skill levels, they are more likely to be productive workers and members of society when they exit the educational system. Similarly, the achievement and skill levels of adults provide a measure of the current preparedness of the workforce. Finally, outcome indicators may provide information about the nature and effectiveness of educational processes, as they can be used in conjunction with information on educational curriculum, staffing, organization, and expenditures to judge the quality and effectiveness of the system.

Higher education program completion

How do graduation ratios vary across countries?

Higher education "completion" ratios represent the "output" of each country's higher education system by comparing the number of bachelor's degree recipients to the population at the typical graduation age. This ratio measures the theoretical rate at which individuals enter the workforce with specialized knowledge and training.[63] Thus, higher education completion ratios are linked to a country's potential for building or maintaining a skilled labor force. (Background information can be found in "Note on enrollment and completion ratios" in Appendix C: Technical notes.)

Differences in graduation ratios across countries reflect a variety of factors, including the extent to which higher education is accessible and desirable, as well as the typical duration of different programs, graduation requirements, and classification of degrees. As a result, graduation patterns can look different across countries, due to the differential manner in which higher education systems are organized.

This variation in the organization of higher education creates difficulties for international comparisons. For instance, as described in the preceding section on student participation, one should expect non-university higher education graduation ratios to be greatly affected by the availability of occupationally specific education and training at the upper secondary level. Furthermore, the distinctions between different fields of study are not entirely consistent across countries, and, in such cases, graduates are assigned by each country to the category that seems most appropriate. Finally, the duration of studies can vary across countries for programs that otherwise seem similar.

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[63] Graduation or "completion" ratios allow comparisons across countries by standardizing the number of graduates from programs at a particular level to the size of the general population in an age group "typical" for graduation at that level. A ratio should not be interpreted as a graduation *rate* (that is, as a percent of graduating students among all students or as a percentage of the general population within a certain age range). This ratio compares the number of students graduating from particular levels of education to the number of persons at the "graduation reference age" (see footnote 2). More background information can be found in "Note on enrollment and completion ratios" in Appendix C: Technical notes.

The OECD has attempted to accommodate these varying durations in its classification of higher education *levels*. "Non-university" higher education programs are typically shorter than university programs and do not lead to university degrees. "First" university programs are those that lead to a student's first university degree. They are "short," if about four years or fewer in duration (e.g., U.S. bachelor's), and "long," if longer than four years (e.g., Italian *Laurea* or German *Diplom*). "Second" university programs are those that typically require a first university degree for entry (e.g., U.S. master's). "Ph.D. or equivalent" degrees are terminal degrees.

. Very few countries have programs classified at every level. In our group of countries, only Sweden has. More commonly, different countries offer different combinations of degree programs. While all countries in our group classify some programs as non-university higher education programs, *university* programs tend to be arranged in combinations of either two degrees – "long" first university and Ph.D. degrees – or three degrees – "short" first university, second university, and Ph.D. degrees.

The countries in our group sort themselves by the two different degree program combinations, as shown in the table below, Sweden, Spain, and Russia, however, are left out. Spain is different in that it offers substantial numbers of both short and long first university degrees, but relatively few non-university higher education degrees. Russia offers non-university higher education, short university, and Ph.D. degrees.

Table 4.1: Countries with either two or three university degree programs: 1995

Two-degree combinations – "long" first degree and Ph.D.	Three-degree combinations – "short" first degree, "second" degree, and Ph.D.
France, Germany, Italy, Switzerland	Australia, Canada, Japan, United Kingdom, United States

It is probably no coincidence that those countries with more elaborate and occupationally specific education programs at the upper secondary level, such as the "dual system" countries of Germany and Switzerland, tend to have fewer graduates and fewer degree programs in higher

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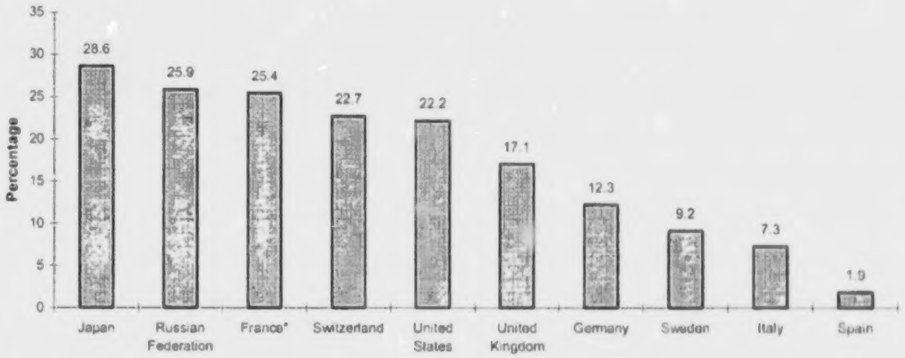
education.

Figure 4.1 below depicts graduation ratios from non-university higher education programs for our group of nations in 1995. The range is wide—from 1.9 in Spain, where scarcely any programs are classified at the non-university higher education level, to 28.6 in Japan. The United States, Switzerland, France, the Russian Federation, and Japan had more than 22 graduates per 100 persons at the graduation reference age.[64] Countries such as Sweden, Italy, and Spain, with a paucity of programs classified as non-university programs, had relatively low graduation ratios—less than 10 graduates per 100 persons at the graduation reference age.

Figure 4.1: Graduates from non-university higher education programs per 100 persons at the graduation reference age, by country: 1995



*1993 data
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

Figure 4.2 below shows graduation ratios from "short" first university programs, those that are four years or fewer in duration. In countries that offer degrees from such programs, graduation ratios averaged around 21. More than 30 students per 100 persons at the graduation reference age obtained a short first university degree in Australia, Canada, the United Kingdom, and the United States. Only 0.8 students per 100 persons at the graduation reference age obtained such a degree in Italy; however, it is important to note that in Italy, 10.7 students per 100 persons at the graduation reference age graduated with a "long" first university higher education degree. Excluding the low graduation ratio in Italy for short first university programs, the average would rise to 24 per 100 persons at the graduation reference age across all the other countries depicted in Figure 4.2.

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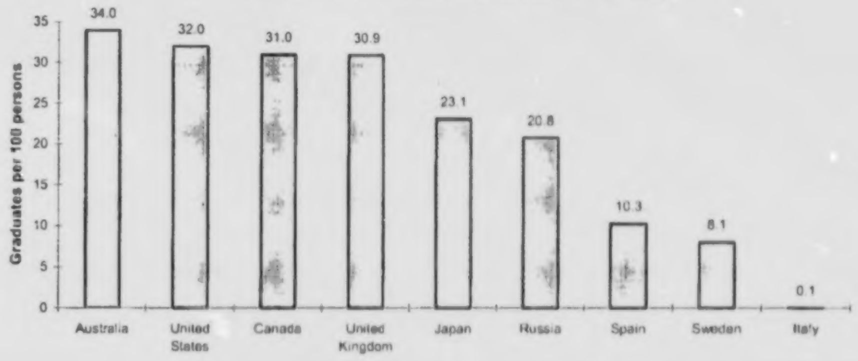
[64] The "graduation reference age" is an age "typical" for graduation from a particular level of education. Even though many students receive degrees at ages other than the graduation reference age, the ratio nevertheless allows useful comparisons across countries because it places the number of graduates in relation to the size of a standard cohort of students. Assuming that the sizes of different age cohorts within the same general age range are approximately equal, the ratio will not be significantly affected even if large numbers of students receive degrees at ages other than the graduation reference age.

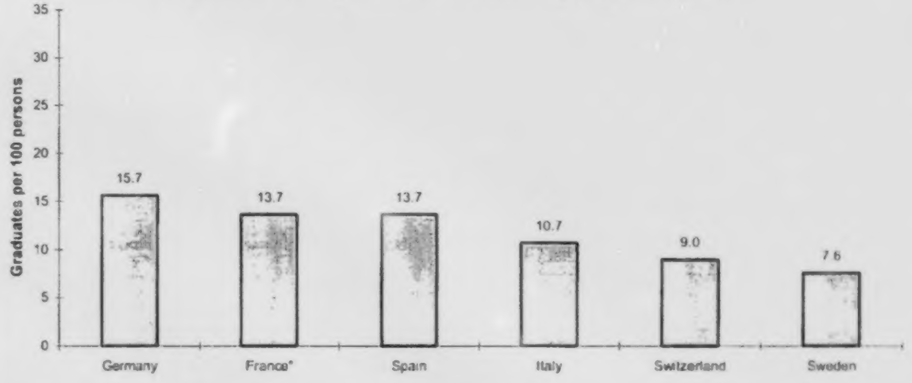
Figure 4.2: Graduates from short first programs per 100 persons at the graduation reference age, by country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

While the majority of our countries offer only short first university programs, several nations provide "long" first university degrees, which take more than four years to complete. Over all of the countries depicted in Figure 4.3 below, graduation rates for long first university degrees averaged approximately 11 percent. In Germany, 15.7 students per 100 persons graduated with a *Diplom* from a long first university degree program. Arguably, earning a long first degree could be equated with obtaining both bachelor's and master's degrees in the United States.

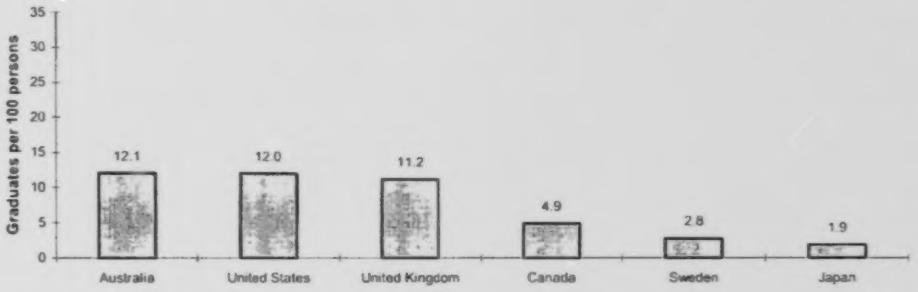
Figure 4.3: Graduates from long first university degree programs per 100 persons at the graduation reference age, by country: 1995



*1993 data
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

Figure 4.4 below shows the ratio of graduates from "second" university programs (e.g., master's degrees in the United States). For all the countries depicted in Figure 4.4, the range is relatively wide, from 1.9 graduates per 100 persons in Japan to 12.1 in Australia. Australia had the highest ratio of second university degree graduates (12.1), followed by the United States (12.0), and the United Kingdom (11.2). Some countries in our group, including most of those that award "long" first university degrees, do not award second university degrees.

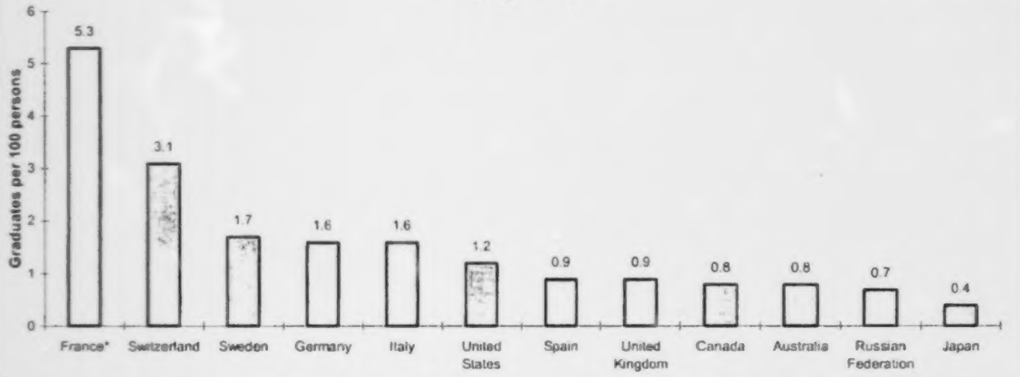
Figure 4.4: Graduates from second university degree programs per 100 persons at the graduate reference age, by country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

The Ph.D. degree represents the highest level of academic study, and the proportion of students completing a Ph.D. program is considerably smaller than that of students obtaining first or second university degrees. Among the countries depicted in Figure 4.5 below, graduation ratios from Ph.D. programs averaged 1.3 per 100 persons, and ranged from 0.4 in Japan to 5.3 in France. Sweden, Germany, Italy, and the United States maintained a 1 to 2 per 100 persons Ph.D. graduation ratio. The relatively high Ph.D. graduation ratios in France (5.3) and Switzerland (3.1) may at least partly reflect the absence of second university degree programs in those countries. Students wishing to continue their university higher education beyond the first university degree level must enter Ph.D. programs to do so. Five other countries also lack second university degree programs.

Figure 4.5: Ph.D. graduates per 100 persons at the graduation reference age, by country: 1995

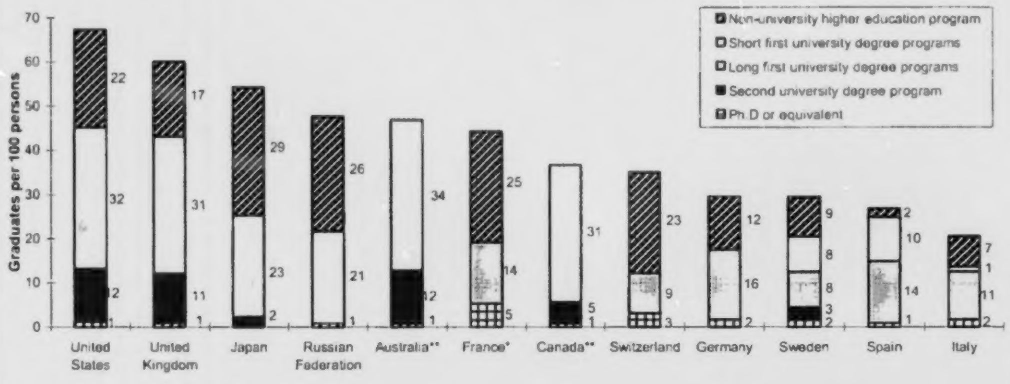


*1993 data
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

Figure 4.6 below presents graduation ratios for all higher education degree programs—non-university degrees, short and long first university degrees, second university degrees, and Ph.D. degrees (or the equivalent), within one chart, in order to present a comprehensive picture of total degree production across all of the countries within our group.

The United States, the United Kingdom, and Australia had similar patterns of degree production—about 30 degrees per 100 persons at the graduation reference age for short first university programs, 12 per 100 persons at the second university level, and under 1 per 100 persons at the Ph.D. (or the equivalent) level. In addition, in both the United States and the United Kingdom, the graduation ratio for non-university programs was approximately 20 per 100 persons; data for non-university graduation ratios were not available for Australia.

Figure 4.6: Higher education graduates per 100 persons at each graduation reference age, by type of degree and country: 1995



*1993 data

**Missing non-university higher education data for Canada and Australia

SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

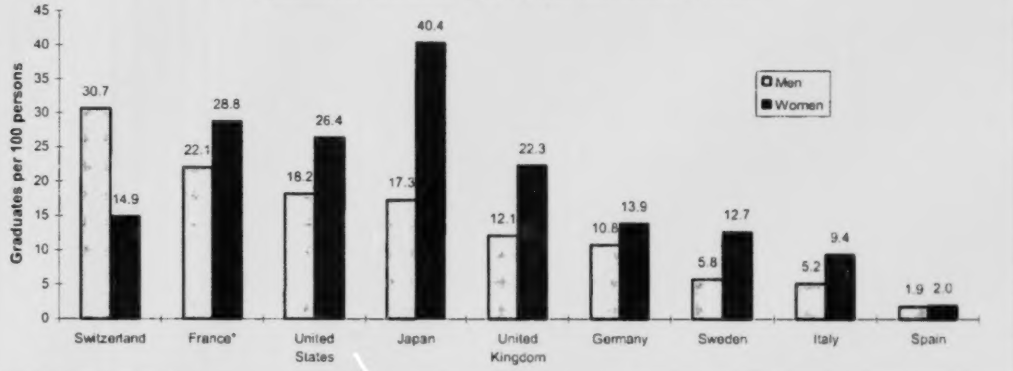
Figure 4.6 reflects the proportion of students earning different types of higher education degrees in our group of nations. Note that the data presented in Figure 4.6 depicts the production of *degrees*, as well as graduates, over the period of one year. Any person getting more than one degree in a year would be counted more than once.

In Table A.8 of Appendix A: Basic reference tables, all the major degree names are categorized for each country in our focus group and classified by level of higher education. The table contains detail of the various higher education program structures across countries. Some countries tend to be more economical in their degree nomenclature than others. That is largely because degrees in those countries tend to identify levels or "degrees" of accomplishment, regardless of the field of study. Countries with many degree names tend to invest more precise meanings in them, so that they may represent official occupational certifications, fields of study, or modes of training, as well as a general level of accomplishment.

Across countries, do completion ratios for men and women differ?

For all of the countries illustrated in Figure 4.7 below, except Switzerland, more women than men graduated from non-university programs in 1995. However, the extent of the difference between these male and female graduation ratios varied. In Japan, for instance, more than twice as many women than men graduated from non-university programs. In contrast, in Spain, the number of male and female graduates differed by only 0.1 percentage point. In the United States, the gender difference was slightly wider—8.2 percentage points.

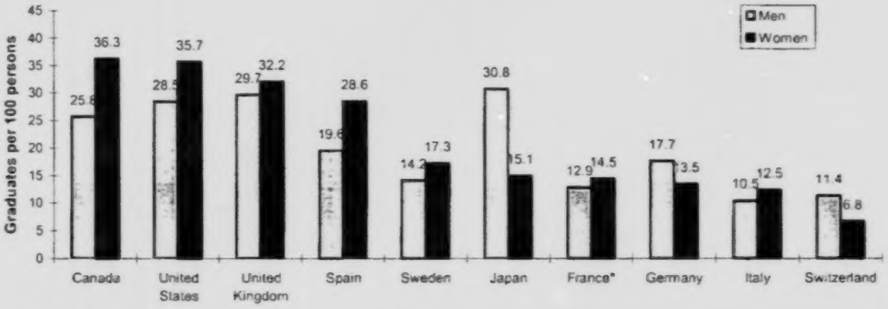
Figure 4.7: Non-university higher education graduates per 100 persons at the graduation reference age, by sex and country: 1995



*1993 data
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

This pattern of female predominance continued at the university level, for graduates earning their first university degree, in all countries except Japan, Germany, and, again, Switzerland. While Japan had far more female graduates at the non-university level, at the university-level, their gender difference favored men. In the United Kingdom, Italy, and Spain, the gender gap (favoring women) was even wider at the first university degree level than at the non-university level.

Figure 4.8: Graduates from first university degree programs per 100 persons at the graduation reference age, by sex and country: 1995



*1993 data
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G2.1. (See also Table B4.1 in Appendix B)

Gender differences in graduation ratios continued to favor women at the second university degree level of higher education in the United States, Australia, Sweden, and the United Kingdom. However, the differences between the proportion of male and female graduates were narrow relative to those at the non-university or first university level.

Only at the Ph.D. level did gender differences in graduation ratios generally favor men. Indeed, in a group of 24 OECD countries with data adequate for making the comparison, only one – Ireland – showed a female majority among its Ph.D. graduates. In our focus group of countries, all showed male majorities among Ph.D. graduates, in some cases by lopsided margins of 7 to 1 or even 20 to 1. The average ratio of male to female Ph.D. graduates in our group of countries was about 4 to 1. The countries with the lowest ratios (and, thus, the largest proportion of female Ph.D. graduates) were Russia (1.2 to 1), Italy (1.3 to 1), and Spain (1.4 to 1). The U.S. ratio was 1.6 males to every 1 female Ph.D. graduate.

Across countries, how do degrees earned by higher education graduates vary by field of study?

Differences in degree distribution across fields of study can be attributed to a variety of factors, including students' own backgrounds, interests, and aptitudes, different program classification systems, and certification requirements, as well as broader economic forces. A student's choice to specialize in a particular subject area may be influenced by its ultimate "payoff" in the world outside of school—the potential earnings of specific job positions, the number of opportunities for that position within the labor market, and, perhaps, even its potential prestige.

The following chart shows the proportions of total non-university higher education and university-level degrees awarded in 1995, in four countries, broken out by four general fields of study—medical and natural sciences, mathematics and engineering, law and business, and humanities and general studies. Although every country is unique in its distribution of degrees by field of study, most countries are typified by one of these four models.

The chart displays the distribution of degrees by fields of study, respectively, for Canada, the United States, Japan, and Germany. They range from a country – Canada – with a relatively small proportion of degrees in technical fields, such as science and engineering, and a relatively large proportion of degrees in more general fields, such as the humanities, law, and business, to a country – Germany – with the opposite characteristics. Countries' bar charts are arranged in order by the proportion of "technical" degrees, with each succeeding country having a larger proportion of them, and a smaller proportion of "general" degrees.

Degree distribution by field of study in Germany typifies a pattern also found in the Russian Federation. Both countries had a relatively high percentage of awarded degrees in mathematics and engineering (36 and 35 percent, respectively) and science (29 and 21 percent, respectively). "Technical" degrees in the sciences, mathematics, and engineering made up the majority of higher education degrees awarded in each of these countries. This distribution is all the more remarkable for Germany, given that some technical programs that other countries would classify at the non-university higher education level are, in Germany, classified at the upper secondary level and, therefore, not even included in the statistics used for Figure 4.9.

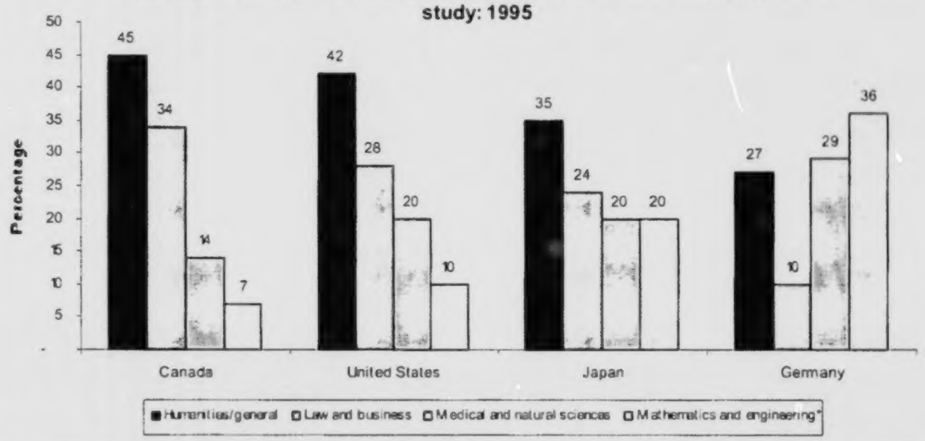


Figure 4.9: Percentages of total non-university higher education and university-level degrees in Canada, the United States, Japan, and Germany, by field of study: 1995

*Category includes architecture and computer science
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Tables G3.1 and unpublished tabulations. (See also Table B4.2 in Appendix B)

Japan followed a slightly less technical pattern of degree distribution than Germany, with law and business and the humanities making up almost 60 percent of all higher education degrees awarded to graduates. Still, in Japan, there was a higher percentage of engineering degrees than were awarded in most other countries. Other countries that had similarly high proportions of degrees awarded in mathematics, engineering, and the sciences as Japan included Italy, Switzerland, Sweden, and the United Kingdom.

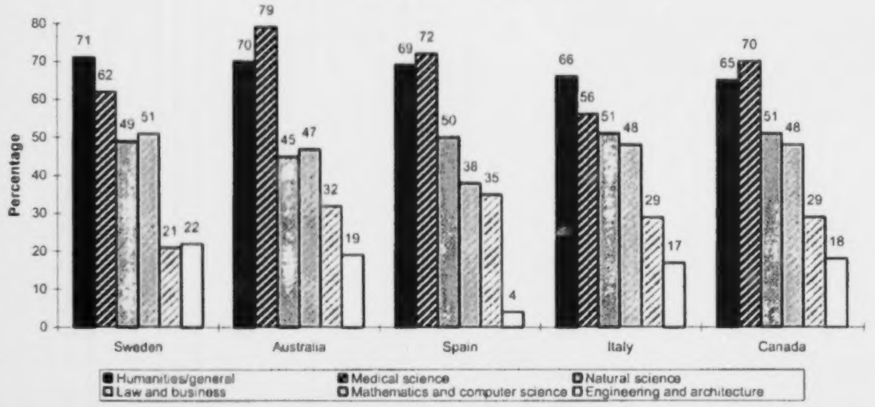
The pattern of awarded higher education degrees in the United States was similar to that found in Australia, France (1993 data), and Spain. Law and business degrees, alone, represented over a quarter of degrees awarded to higher education graduates; the humanities and general studies made up more than a third of awarded degrees; and mathematics and engineering, and the natural and medical sciences, combined, comprised about a third or fewer higher education qualifications.

In the most extreme case, degrees awarded in the less technical, more general fields, predominated in Canada, comprising over three-quarters of all degrees awarded, with a substantially smaller proportion of degrees – less than a quarter – awarded in mathematics, engineering, and the sciences.

Across countries, are men and women equally represented by degrees awarded in different fields of study?

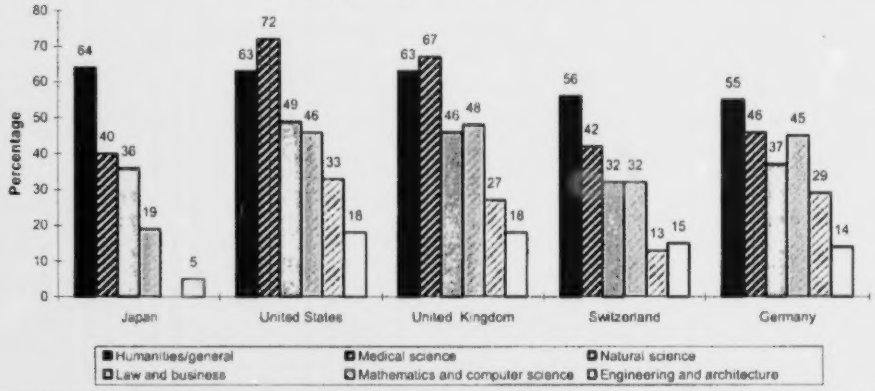
Women graduated at the same or higher rate than men from first and second higher education programs in most of the countries in our group, yet female graduates were not equally represented in all fields of study. Figures 4.10a and 4.10b show the proportions of female graduates across five different general fields of study in 10 countries of our focus group. Women comprised the majority of graduates with humanities degrees in 10 out of 10 countries, and the majority with medical science degrees in 7 out of 10 countries. By contrast, female graduates in mathematics, computer science, engineering and architecture were a minority in each and every country. Females comprised a majority of degree recipients in the natural sciences in only 4 countries, and in law and business only in Sweden.

Figure 4.10a: Percentage of university-level degrees awarded to women, by field of study and country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G3.2. (See also Table B4.3 in Appendix B)

Figure 4.10b: Percentage of university-level degrees awarded to women, by field of study and country: 1995



SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table G3.2. (See also Table B4.3 in Appendix B)

Higher education and labor market outcomes

In order to understand the type of education that the labor markets of different countries demand, it is important to consider the relationship between the rate of labor force participation or unemployment and educational attainment. First of all, the "labor force" is that group of people in each country who are either employed or actively seeking employment. Since educational attainment is an

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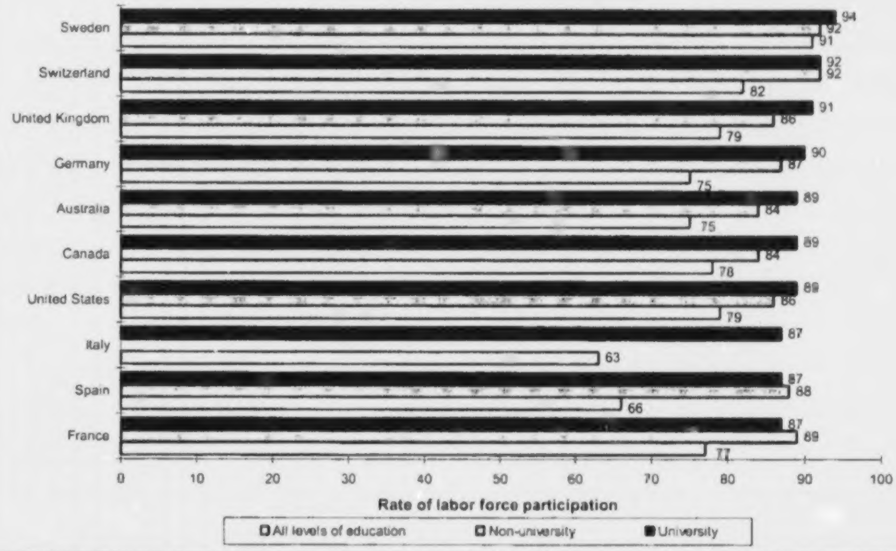
indicator of skill level, it often acts as a signal to employers of job applicants' qualifications.

Figure 4.11 offers evidence that higher levels of educational attainment correlate with a proclivity to participate in the labor market. Individuals who completed higher education by 1995, in a university or non-university program, participated in the labor force in each of our countries at a higher rate than the average for all educational levels. Sweden showed the smallest difference (3 percentage points) when comparing the average labor force participation rate for those at all levels of educational attainment to those who completed university. Conversely, Italy had the largest difference of 23 percentage points. The average difference across countries between the all levels rate and university graduates' rate was 12 percentage points.

Figure 4.11: Rate of labor force participation for the population 25 to 64 years of age, by level of educational attainment and country: 1995

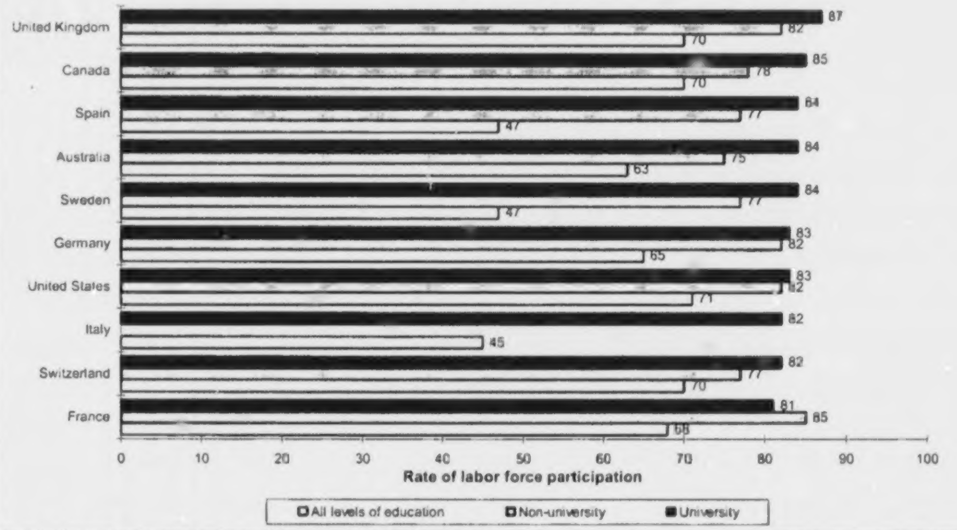


* "All levels" includes all persons ages 25 to 64.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table E1.1a. (See also Table B4.4 in Appendix B)

There is even a discernible difference between the university and non-university levels of higher educational attainment in the labor force participation rate. Figure 4.11 shows that, for 6 of 9 countries, graduates of university programs were more likely to have participated in the labor force than were those whose highest level of educational attainment was non-university higher education.

Figure 4.12 displays the same measures as Figure 4.11, but for women alone. Larger proportions of women participated in the labor force at higher levels of educational attainment in all countries but France, where the female non-university higher education graduate labor force participation rate exceeded the female university graduate labor force participation rate.

Figure 4.12: Rate of labor force participation for women 25 to 64 years of age, by level of educational attainment and country: 1995

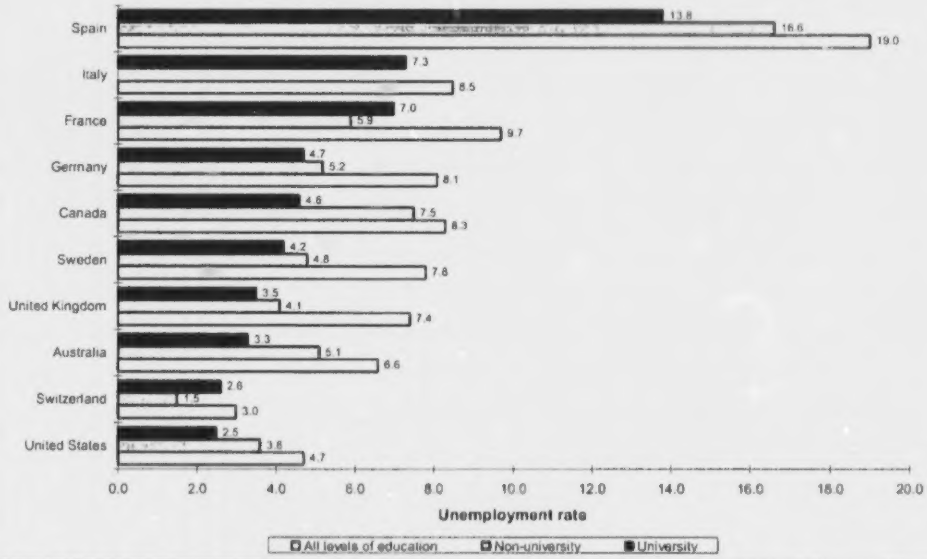


*"All levels" includes all persons ages 25 to 64.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table E1.1b. (See also Table B4.5 in Appendix B)

Comparing male to female labor force participation rates, the rate for females was generally higher than that for male university graduates. In only one other country – Sweden – was the female rate even equal to the male rate among non-university higher education graduates.

The unemployed are members of the labor force not currently employed. They actively seek employment, and are available to work, but do not work. Figure 4.13 shows higher education attainment to be inversely correlated with unemployment. In every country of our focus group, higher education graduates were less likely than the average adult to be unemployed. In some countries -- Australia and the United Kingdom -- the unemployment rate for university graduates was half or less than half the average unemployment rate. Except in France or Switzerland, university graduates also fared better than their non-university higher education graduate colleagues.

Figure 4.13: Unemployment rate for the population 25 to 64 years of age, by level of educational attainment and country: 1995



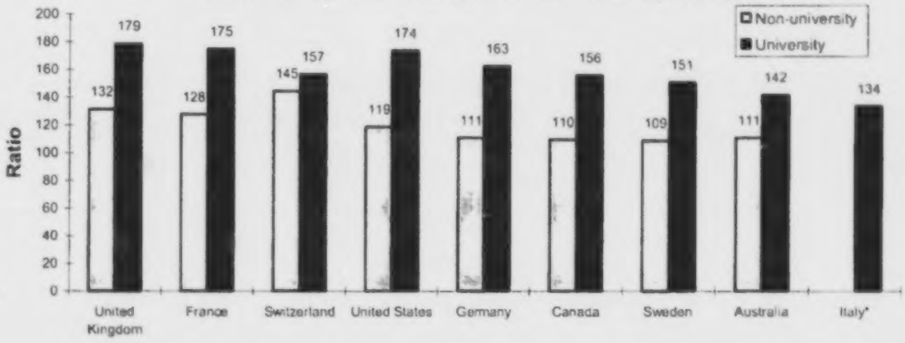
*"All levels" includes all persons ages 25 to 64.
SOURCE: Organisation for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table E2.1a. (See also Table B4.6 in Appendix B)

Overall, women showed the same relationship between unemployment rates and levels of educational attainment. Women who had completed a higher education program were less likely to be unemployed, compared to other women who had attained less.

The ultimate payoff to higher levels of educational attainment should be found not only in more employment opportunities and greater job security, but in higher earnings. While some students who aspire to higher education degrees may do so primarily for the intrinsic satisfaction, many believe they increase their earnings potential through higher educational attainment.

Figure 4.14 displays the "relative earnings" of persons ages 25 to 64 in our focus group of countries for 1995. The average annual earnings (from employment) of adults with non-university higher education or university degrees was divided by the average annual earnings of adults whose level of educational attainment was an upper secondary diploma (and multiplied by 100 so as to be expressed as an index). The resulting ratios for all countries were above 100; meaning that adults with higher education degrees earned more than those without. Moreover, for all countries, adults with university degrees earned more than those whose highest level of educational attainment was a non-university higher education credential.

Figure 4.14: Ratio of average earnings of persons aged 25 to 64 with a higher education degree to those with an upper secondary level of education (times 100), by level and country: 1995



* data missing for non-university higher education level
SOURCE: Organisation for Economic Co-Operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table E4.1a. (See also Table B4.7 in Appendix B)

These numbers, alone, do not prove that higher education degrees are always unambiguously beneficial, even on average. The attainment of higher education credentials requires an investment of time, money, and effort that may not always be fully compensated by an increase in earnings.

The earnings statistics also suggest a proportionally greater increase for higher levels of educational attainment for women than for men. At the non-university higher education level, the relative earnings ratio (over the average earnings of adults with only upper secondary diplomas) is larger for women than for men in seven of the eight countries in our group with data sufficient for making the calculation. At the university level, however, the relative earnings ratio is larger for women than for men in only four of nine countries. Nonetheless, considering the two different levels of higher education in nine countries, the relative earnings ratio is larger for women than for men in 11 out of 17 cases. These relatively larger payoffs for women may help explain why female higher education enrollments now outnumber males' in many countries.

Adult literacy by level of educational attainment

Over the past few decades, groups of countries have cooperated in administering standardized achievement tests to representative samples of their students. The country-level results have achieved some public attention, presented as outcome measures to compare the relative quality of countries' educational systems. Mathematics and science have been the most popular subject areas, but reading literacy and geography have also been tested in recent years. The frequency of these international comparisons seems to be increasing, with some plans for regular, periodic administration in the primary subject areas, and a special administration soon of a test in civics.

With one exception, however, these tests have been administered only to primary- and secondary-school students, most often at the 4th and 8th grades, and occasionally at the 12th grade. These tests have assumed that in the most common subject areas, curricula across countries share some common elements—elements that can be included in tests to produce comparable student scores. It would be difficult to construct a similar test for higher education in light of the even more differentiated higher education curriculum.

Partly because of this problem and a large number of other potential difficulties, no international test has been administered to samples of higher education students. One test has been administered to country-representative samples of adults, however, including those who had completed higher education degrees. The International Adult Literacy Survey (IALS), conducted by Statistics Canada and the Educational Testing Service in 1994 and 1997, tested representative samples of adults in eleven countries.

Traditionally, literacy was defined simply as the ability to read and write at a primary education level. In the IALS, literacy was conceptualized to involve three distinct dimensions (prose, document, and quantitative literacy) and cover a range of skills. To assess prose literacy skills, which are the skills most people think of as literacy, adults were asked to understand and use information contained in editorials, news stories, poems, and fiction. Document literacy skills were assessed by having adults demonstrate their skill at locating and using information in job applications, payroll forms, transportation schedules, maps, tables, and other graphics. To assess quantitative literacy skills, adults were asked to carry out such arithmetic operations as balancing a checkbook, figuring out a tip, completing an order form, and determining the amount of interest to be paid on a loan.

Literacy has become an extremely important topic, with substantial implications for economic outcomes. Countries are part of an increasingly global economy. More and more, they are competing with one another for jobs, especially the highly skilled, technical jobs one finds in high growth industries. Countries may need to educate workers who are not only prepared for, but can excel in such jobs. Furthermore, many jobs, even what were once considered "low tech" jobs, are requiring higher literacy levels than before. Some jobs that required only physical skills (e.g., operating a piece of machinery) are predicted to increasingly require literacy as well as physical skills (e.g., reading a computer screen in order to operate the machine). Taken together, these factors may translate into an increased demand for more literate workers.

At the level of the individual worker, low levels of literacy may relegate certain members of society to jobs requiring fewer skills, and, thus, lower pay. In addition, at the societal level, with the development of close economic ties between countries (e.g., the European Union and the North American Free Trade Agreement), the skill levels of the population play an increasing role in corporate location decisions, and, therefore, growth in employment opportunities.

Beyond the role of a skilled workforce in promoting economic growth, high literacy levels also are required to perform many activities in daily life. Relatively high levels of literacy, for example, are required to determine the correct dosage of aspirin from the label on the bottle, understand instructions for assembling a bicycle, perform calculations (e.g., kilometers between two cities), and locate information (such as tomorrow's weather) from graphs, maps, and tables.

Although higher literacy may be associated with higher educational attainment, a perfect relationship between literacy skills and educational attainment may not exist. Some people with low levels of education could have high levels of literacy, because they may have developed their literacy skills after leaving school, by returning to school later, or by obtaining on-the-job training, and so on. Alternatively, some people with high levels of education may have low levels of literacy, possibly because their literacy skills have diminished since they left the education system; or, they may not use their literacy skills in their daily lives or jobs.

As one might expect, in all countries, high prose literacy levels were associated with high levels of educational attainment. (Levels ranged from 1 to 5, with 1 representing the lowest level and 5 representing the highest.) As Figure 4.15 shows, there was substantial variation among countries, even in the proportion of university graduates scoring at levels 4 or 5, with 17 percent in Poland, about 26 and 32 percent in Switzerland (German and French regions), 34 percent in the Netherlands, 39 percent in Germany, 43 percent in Ireland, 45 percent in Belgium and the United Kingdom, 47 percent in New

Zealand, 50 percent in the United States, 55 percent in Canada, and 59 percent in Sweden.[65] [Note that the countries included comprise a different group than our focus group. Though most are also members of our focus group, some are not. We have chosen to include all the countries that participated in the IALS in order to comprise a group of sufficient number to afford some variation and comparison.]

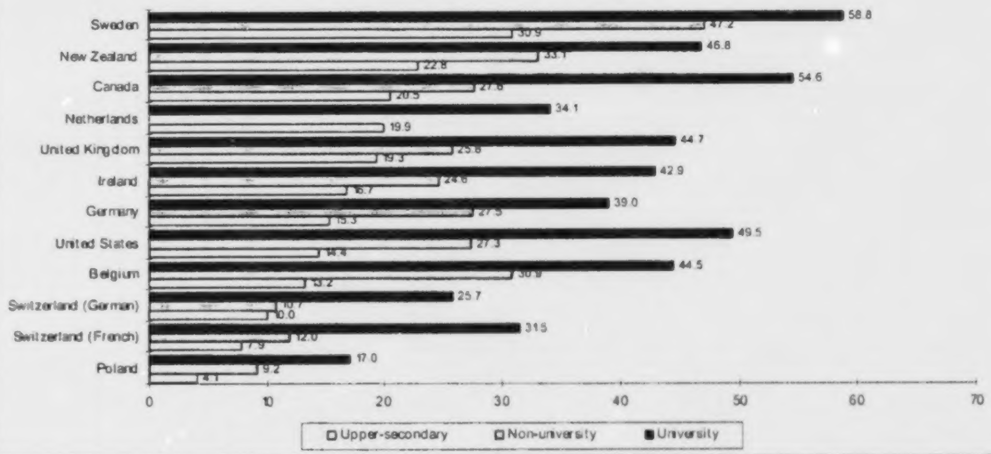


Figure 4.15: Percentage of adults who scored at prose literacy levels 4 or 5, level of educational attainment and country: 1995

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Condition of Education, 1998*, Indicator 21, pp. 78-79. (See also Table B4.8 in Appendix B)

Among persons with upper secondary education, which was the most common attainment level, there were also, sometimes, substantial proportions scoring at level 4 or 5 on the prose scale – ranging from 4 percent in Poland to around 20 percent in the Netherlands and Canada to 31 percent in Sweden.

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[65] According to IALS, "[Level 4] tasks require readers to perform multiple-feature matching or to provide several responses where the requested information must be identified through text-based inferences. Tasks at this level may also require the reader to integrate or contrast pieces of information, sometimes presented in relatively lengthy texts. Typically, these texts contain more distracting information and the information that is requested is more abstract [than those at lower literacy levels]. [Level 5] tasks require the reader to search for information in dense text that contains a number of plausible distracters. Some

University graduates averaged higher prose literacy scores than non-university higher graduates in every participating country. The gap in average scores between the two levels ranged from about 10 percentage points in Germany and Sweden to over 20 percentage points in the United States and Canada.

The gap in average prose literacy scores between university graduates and upper-secondary school graduates could be even more dramatic. They ranged from about 13, 14, and 16 percentage points in Poland, the Netherlands, and German-speaking Switzerland, respectively, to over 30 percentage points in the United States, Canada, and Belgium.

The intergenerational legacy of high educational attainment

Apparently, one's level of educational attainment not only affects one's own prospects, but those of one's progeny as well. For one of the previously mentioned international assessments of secondary school students – the Third International Mathematics and Science Study (TIMSS) – 8th grade students' scores on math and science tests were classified by the highest level of their parents' educational attainment, as reported by the students in background questionnaires administered with the tests. Research has demonstrated, with abundant evidence, that a student's educational achievement tends to be associated with parents' educational attainment. This association can affect both the academic proficiency with which young children start their school careers and the rate at which they advance through their school careers.[66]

It is also clear from the TIMSS data that parents' educational attainment was positively related to students' mathematics and science achievement in 1994–1995. In every country shown in Figures 4.16 and 4.17, eighth grade students with more educated parents had higher average eighth grade achievement in mathematics or science than did students whose parents were less educated. There was

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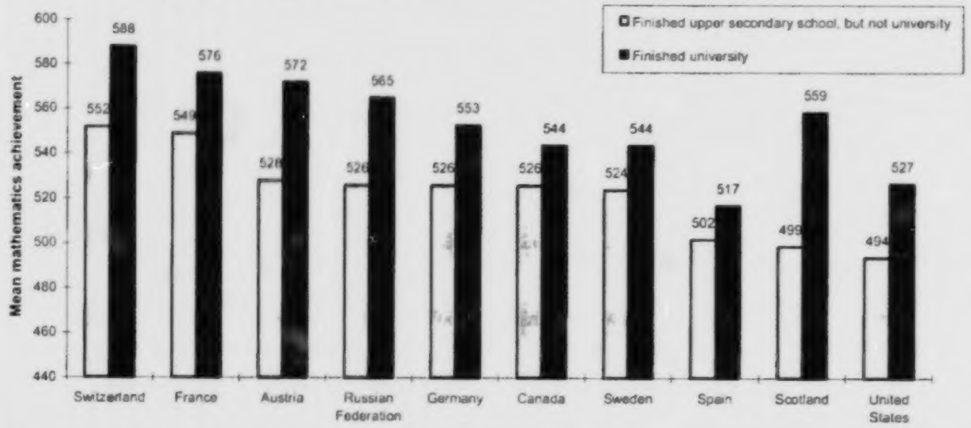
require readers to make high-level inferences or use specialized knowledge."

considerable variation across countries, however, in the gain to children of a parent's completion of higher education. "Gain" is illustrated by the difference between the average achievement scores of 8th graders with university-educated parents and those whose parents' level of educational attainment was upper-secondary. In some countries, the attainment by a parent of higher levels of education translated into relatively small gains in their children's achievement (e.g., Spain); in other countries, the gains could be relatively large (e.g., Scotland). (The United Kingdom is represented here only by Scotland, which administered the TIMSS separately from England and Wales. The latter countries lacked sufficient data for this particular indicator.)

Figure 4.16: Mean mathematics achievement for students in the eighth grade, by parent's highest level of educational attainment and country: 1995



SOURCE: International Association for the Evaluation of Education Achievement (IEA), Third International Mathematics and Science Study. (See also Table B4.9 in Appendix B)

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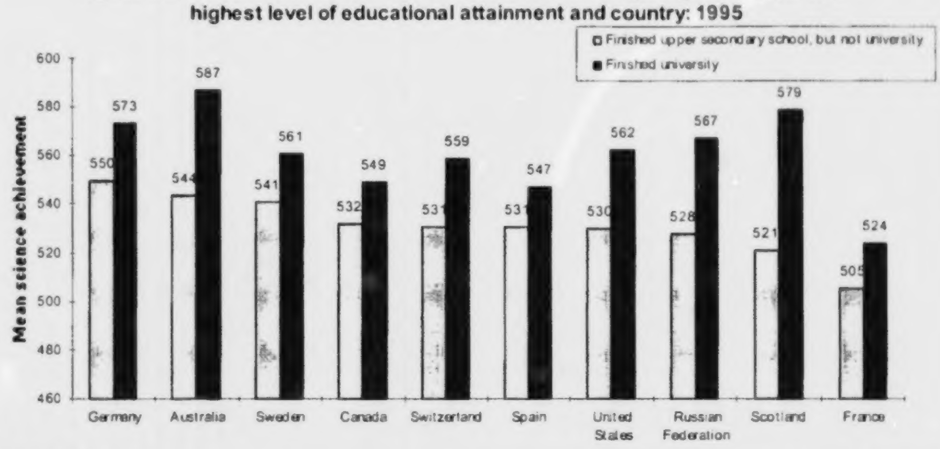
[66] See, for example, Burtless, pp. 1-42 and Koretz, pp. 19-21.

Figure 4.17: Mean science achievement for students in eighth grade, by parents' highest level of educational attainment and country: 1995



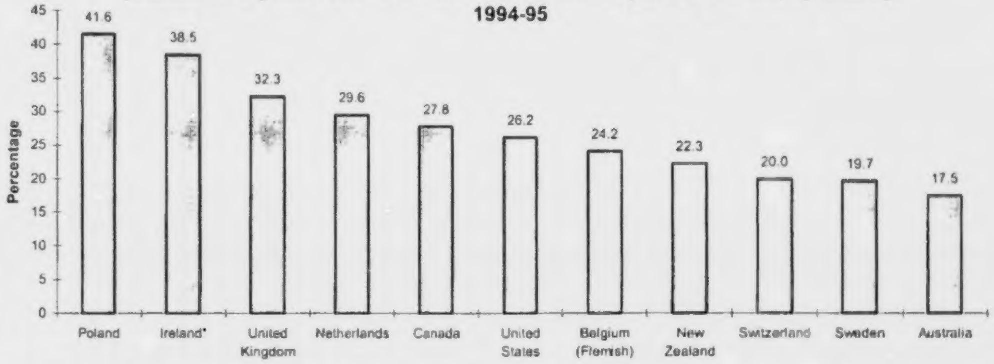
SOURCE: International Association for the Evaluation of Education Achievement (IEA), Third International Mathematics and Science Study. (See also Table B4.10 in Appendix B)

The ultimate intergenerational legacy of a relatively high level of educational attainment is the repetition of the same in the next generation. Analysts at Statistics Canada, the organization responsible for the primary data analysis of the International Adult Literacy Study, estimated the probability of a person attaining at least a post-secondary level of education according to their parents' level of educational attainment.

We know that educational attainment is an important contributor to level of literacy and social position in society. One of the factors determining how much education one receives relates to the level of education attained by their parents. A highly supportive learning environment at home (here essentially proxied by the level of educational attainment of the parents) is likely to be reflected in higher educational attainment of the children. The supportive environment will be manifest not only through a financial capacity to support children's higher education, but also through day-to-day interactions of "higher intellectual quality" between parents and children. This analysis of data from the IALS provides a measure of the likelihood of attaining a post-secondary degree or diploma in relation to parents' highest level of educational attainment. Furthermore, in reviewing the data by age group, it is possible to assess whether the pattern of educational mobility has changed over time (see Detailed Tables in Appendix B).

Figure 4.18 contrasts the average probability of an adult aged 26 to 35 having attained any postsecondary degree given the highest level of the parents' educational attainment. In every country shown, adults with parents whose highest level of educational attainment was a postsecondary degree had a higher probability of attaining a postsecondary degree themselves, on average, than did an adult whose parents whose highest level of educational attainment was less than a postsecondary degree. There was considerable variation across countries, however, in the "gain" to adults of a parent's completion of a postsecondary degree. In some countries, the gain (as represented by the percentage-point difference between the postsecondary degree attainment probabilities for adults with "postsecondary-degreed" parents and "non-postsecondary-degreed" parents) was relatively large (e.g., 41.6 points for Poland, 32.3 points for the United Kingdom). In other countries, the gain was relatively smaller (e.g., about 20 points for Switzerland and Sweden, 17.5 points for Australia). (Again, the IALS group of countries, featured here, differs in membership from the group of countries in focus for most of this report.)

Figure 4.18: Percentage-point difference for 26- to 35-year old adults of attaining at least a postsecondary level of education, between those whose parents achieved a postsecondary level of education and those whose parents did not, by country: 1994-95



*The age group for Ireland includes all adults aged 26 to 55.
SOURCE: Kristen Underwood and Patrice de Broucker, Centre for Education Statistics, Statistics Canada; International Adult Literacy Study. (See also Table B4.11 in Appendix B)

Summary

The countries of our focus group offer both different numbers of higher education degrees and different mixes of types of degrees. While all countries in our group offer some non-university higher education degrees and Ph.D. degrees, some typically offer only one "long" university degree in between those two, while others offer both "short" first and "second" university degrees.

The prominence of different degrees varied from country to country and from degree type to degree type. For example, Japan produced 28.6 non-university higher education graduates per 100 persons at the graduation reference age in 1995, while Spain produced 1.9 per 100 persons. Spain, however, produced twice as many Ph.D. graduates as did Japan in 1995 and France (in 1993) produced almost 16 times as many. Overall, the United States, the United Kingdom, and Japan produced the most higher education degrees of any type in 1995, but some degree data were missing for Australia and Canada. It would appear that women received the majority of higher education degrees of all types, except Ph.D.s, in all countries except Switzerland, Japan, and Germany (for first university degrees).

The mix of degrees by field of study also varied across countries in interesting ways. In Germany and Russia, the majority of non-university higher education and university degrees were awarded in the "technical" fields of science and engineering, whereas, in Canada, less than one quarter were. Women comprised the majority of degree recipients in the humanities and in general studies in all countries of our focus group, and in the sciences and engineering in none.

Higher education attainment seems to have produced beneficial labor market outcomes, ubiquitously. In all countries, adults with higher education degrees participated in the labor force at higher rates than the adult average, earned higher salaries, and suffered unemployment less. The relative superiority of university degrees over non-university higher education degrees was not universal, however; in France, for example, the latter seemed to enjoy more job security than the former.

Finally, data from the IALS show that adults with higher levels of educational attainment tend to display higher levels of literacy, as one would expect. Data from the TIMSS and the IALS show that adults with university degrees raise offspring to higher science and mathematics achievement levels by eighth grade and with higher probabilities of attaining higher education degrees themselves.

CHAPTER 5
RESEARCH AT HIGHER EDUCATION INSTITUTIONS

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In the medieval university, the separation between teaching and research was probably transparent. Students and professors read the same materials, classical and ecclesiastical works mostly, and, in those pre-Gutenberg days, reading materials were precious and few. For teacher and student alike, research and learning were the same, a matter of access to a great book and the wherewithal to read and understand it. The scope of learning was far more limited than today, and a highly educated person might reasonably attain a working level knowledge of all educational fields.

The nature of university research is different today. Professor-researchers have become so highly specialized that only the most advanced graduate students in most cases can replicate their work or, in some cases, even understand it. To the average undergraduate, a professor's research interests or methods might seem esoteric or narrow.

Background on the role of research in higher education

Economic growth in recent centuries, however, owes as much to standardization as specialization. The person commonly credited with standardizing the modern research process — Thomas Edison — brought the same scale and routine to the research process as Frederick Turner had to manufacturing process. Thomas Edison, one might note, however, was not a university professor; nor did he need to be to get his work financed and completed.

Though Edison's work may have been far more sophisticated than that of Roger Bacon or other scientists of earlier centuries, Edison's work was still simple and inexpensive relative to today's.

Materials consisted of those commonly or conveniently found and the work was inductive, consisting of organized series of careful observations, performed in a single laboratory.

Such could not be said of current research in recombinant DNA processing, X-ray lithography, the construction of artificial intelligence algorithms, or (lest we slight the humanists) accurate translations of the Dead Sea Scrolls from ancient Aramaic. The point is, research today can be complex and very expensive and, because some of it is conducted at higher education institutions, it can affect their allocation of resources and organizational structures.

The academic research issue is even further complicated by status concerns among the faculty:

> "…the volume and quality of a university's research effort is now the best guide to its standing and prestige. The *a priori* claim that, to be worthy of university status, an institution of higher education *must* be concerned with teaching *and* research is still a pervasive belief within academe, which constantly asserts itself in negotiations between universities, funding bodies, and governments….in the American university [in particular], research productivity dominates rewards and sanctions for nearly all faculty." (OECD, ***Universities Under Scrutiny***, p.54)

To some degree, the status issue is a "measurement problem." Measurements of research productivity can be extremely crude – a professor may be hired, granted or denied tenure based simply on the number of articles published in academic journals, regardless of their quality, length, or originality. As crude as the measures may be, however, research productivity may be more easily measurable than teaching quality. Moreover, there are simply no standards of teaching quality that are common across institutions. So, professors attain status with research. So, too, do universities.

> "How necessary *are* teaching and research to each other? Policy makers and funding bodies anxious about the effect of spreading diminishing resources too thin are increasingly challenging the intimacy and necessity of the research-teaching relationship….[However,] it is not difficult to identify vested interests behind the view that research is intrinsic to the very concept of a university. The high status of research; the fear that universities without it might slip into a lower institutional league…." (OECD, ***Universities Under Scrutiny***, p.55)

Moreover, a connection between university research and economic development in places like

California's Silicon Valley is strongly argued and believed.[67] For example,

> "...in an attempt to bring training and research in engineering into a closer relationship, the French government has established and provided special funding for a number of specialist centres (FIRTECHS) which can draw upon the services of several universities and specialist laboratories, in such fields as new materials (Paris and Grenoble), chemical engineering (Nancy and Compiègne), artificial intelligence (Grenoble) and robotics (Toulouse)....where a core group of universities with high research productivity, well developed graduate schools and large post-graduate outputs exist, such arguments are today scarcely challenged. But research is expensive..."
>
> "All this has led some policy-makers to argue that whilst it may indeed be the case that the role and function of *some* universities cannot be fulfilled without research and teaching...in close association,...perhaps not all universities have, or should have, the *same* role and functions or undertake the same range of research activities." ..." (OECD, ***Universities Under Scrutiny***, p.55)

For example, while the research function may be set deeply in the firmament of *universities'* identities, it is not so in other higher education institutions.

> "There is usually, but not always, a clear distinction between universities and other higher education institutions in the proportion of core income which is deemed to be for research. Indeed, the extent to which they are funded for research is the most general difference between universities and non-university institutions of higher education in OECD countries. However, the proportion of resources devoted to research in both universities and other higher education institutions varies considerably from country to country." (OECD, ***Financing Higher Education: Current Patterns***, p. 29)

Distribution of higher education research resources across countries

The quantity of resources in higher education devoted to research may not be precisely measurable due to cross-subsidies from instruction and administration budgets. Nonetheless, the Organisation for Economic Co-operation and Development (OECD) develops such measures. The

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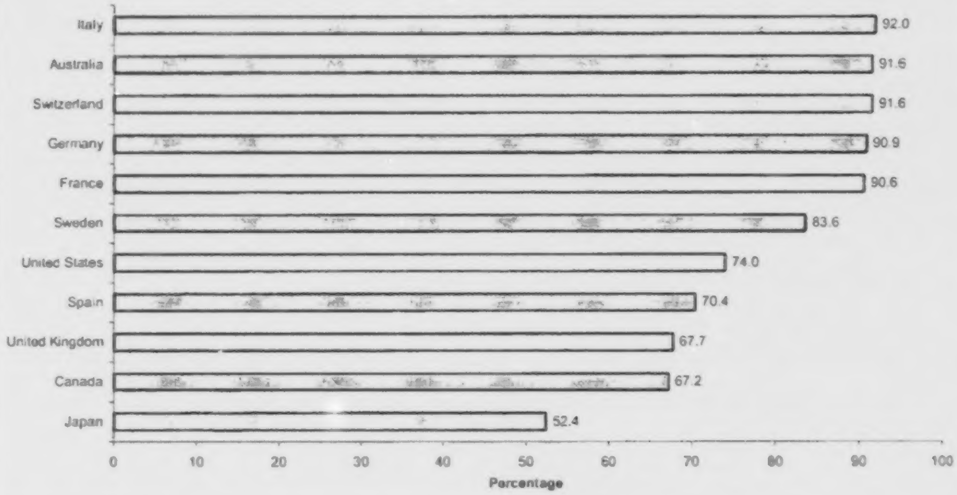
[67] With some validity. In a study of SMSAs, Carlton (1983) found that a pool of technical expertise in a region, such as that one might find at and near a university, can attract technologically sophisticated industries. Bania, Eberts, and Fogarty (1987) found a significant relationship between university research spending and openings of new firms in a cross-section sample of SMSAs. With a sample of U.S. states, Jaffe (1989) used time-series data on corporate patents to find a significant effect of university research on state-level corporate patent activity. Jaffe found weaker, but still positive, evidence that the spillovers were facilitated by local proximity of universities and corporate research centers, however. Jaffe also cited four case studies that confirm the important roles played by universities in the commercial innovation of Silicon Valley and Route 128.

OECD has compiled statistics of research and development (R & D) expenditures across most of its member countries, their source among industry, government, higher education, the non-profit sector, or abroad, and their destinations among the same "sectors."

Comparing the magnitude and relative distribution of R & D expenditure in higher education across countries reveals some interesting contrasts. In 1995, the percent of total research and development expenditures in higher education institutions provided by government among our focus group countries ranged from only 52 percent in Japan to 92 percent in Italy, Switzerland (1992 data), and Australia. (See Figure 5.1)

Figure 5.1: Percentage of total research and development expenditure at higher education institutions provided by governments, by country: 1995



SOURCE: OECD, R&D Database, November 1997. (See also Table B5.1 in Appendix B)

Higher education institutions in Japan and, to a lesser extent, the United States, Spain, the United Kingdom, and Canada, relied more on other sources of funds, such as industry, non-profit

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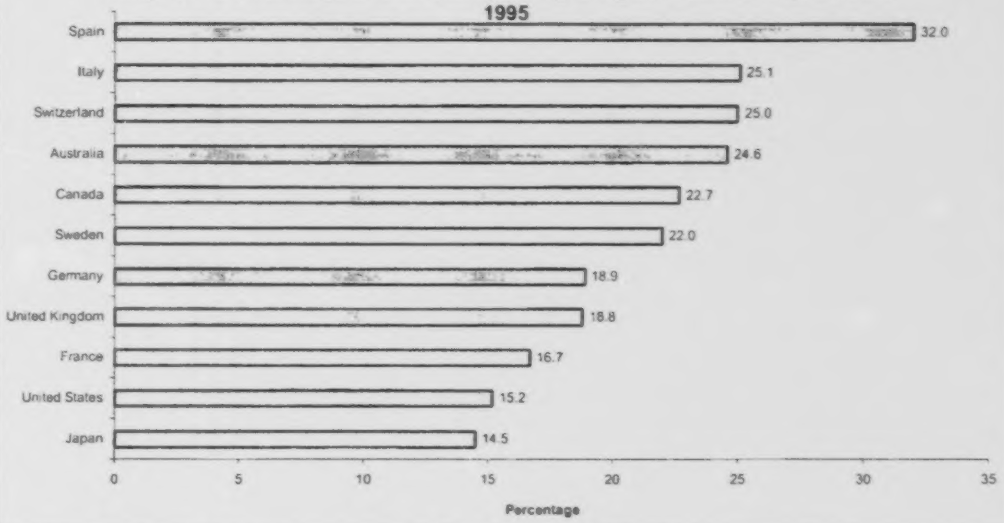
foundations, and direct sales. U.S. higher education institutions relied on government to fund 74 percent of its R & D, industry for 6 percent, non-profits for 6 percent, and 15 percent was self-generated through sales of products and services. (See Table B5.1 in Appendix B)

While all countries of our focus group received the majority of their funds for R & D at higher education institutions from government, a small percentage of funding came from industry. Canada received the highest percentage of industry funding for research at higher education institutions, at 10 percent, whereas Switzerland received only 2 percent of its higher education R & D funding from industry. The United States received 6 percent of its funding for research at higher education institutions from industry. (See Table B5.1 in Appendix B)

Figure 5.2 below shows the share of total R & D expenditure in each country manifest at higher education institutions in 1995. Higher education's share ranged from 32 percent in Spain to 15 percent in Japan. Fifteen percent of R & D expenditure in the United States occurred in higher education institutions.

Figure 5.2: Percentage of total R&D spending at higher education institutions: 1995



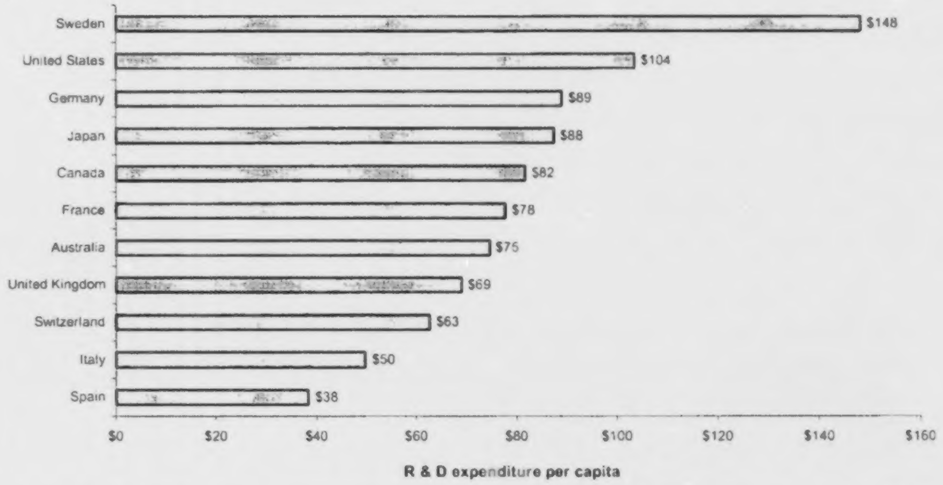
SOURCE: OECD, R&D Database, November 1997. (See also Table B5.1 in Appendix B)

It may seem bewildering that Japan, with its strong reputation for research and development, ranks last among the focus group of countries in both Figures 5.1 and 5.2. But, these figures reflect only higher education's role in each country's R & D effort. In Japan's case, the figures may be more revealing for what they leave out. In Japan, 72 percent of all R&D funding comes directly from industry. Switzerland, with 67 percent, and Germany and the United States, with 61 and 60 percent, respectively, are the only other countries with an industry share above 50 percent. (See Table B5.1 in Appendix B)

In terms of total dollar amounts, the United States far outspent the other countries with over $27 billion at higher education institutions for R&D. Japan was a distant second at just under $11 billion. No other country in our group spent over $8 billion.

Total expenditure is obviously correlated with the size of a country's population and economy, however. So, a more valid assessment of higher education research spending compares dollars with total population. Figure 5.3 displays countries' ranking on such a scale.

Figure 5.3: R & D expenditure at higher education institutions per capita, by country: 1995

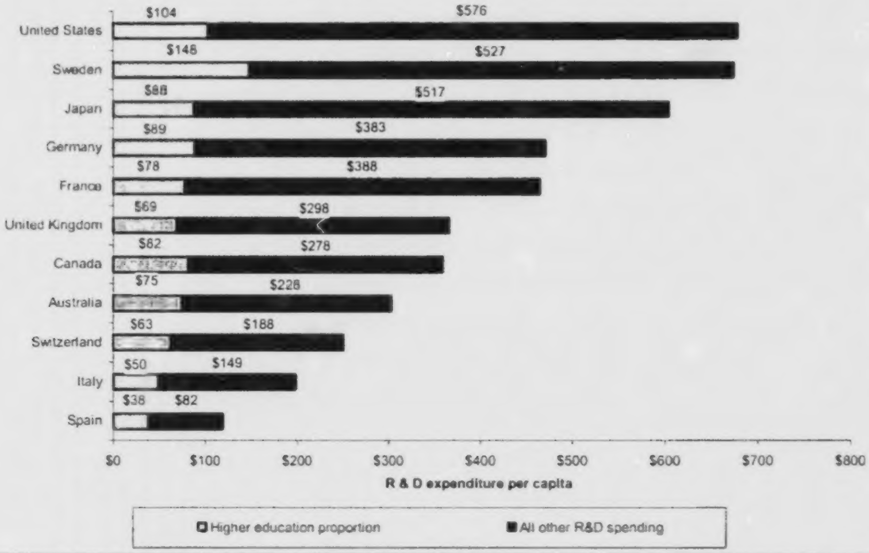


SOURCE: OECD, R&D Database, November 1997; U.S. Bureau of the Census, *Statistical Abstract, 1997*, pp.845-847. (See also Table B5.2 in Appendix B)

Looking at Figure 5.3, one can see that Sweden spent $148 per capita on research at higher education institutions. The United States spent the second-largest per capita amount, at $104. Spain was the lowest spender at $38 per capita.

Putting these figures into context, Figure 5.4 compares all R&D expenditures with total population, including the share that was spent at higher education institutions.

Figure 5.4: Total R & D expenditure per capita and proportion that is spent at higher education institutions, by country: 1995



SOURCE: OECD, R&D Database, November 1997; U.S. Bureau of the Census, *Statistical Abstract, 1997*, pp.845-847. (See also Table B5.2 in Appendix B)

Figure 5.4 illustrates how countries vary in their R&D strategies, with some relying more on higher education institutions than others. Rates of spending on total R&D do not correlate perfectly with rates of spending in higher education institutions. Some countries with relatively large rates of total R&D spending spend relatively little of it in higher education institutions. Other countries with relatively small rates of total R&D spending spend relatively large proportions of it in higher education institutions.

Summary

Both the role of research within the university and the nature of research itself have changed dramatically in the thousand-year history of the university. Research has become more complex and expensive and scientists have become more specialized. The knowledge required for one to make meaningful contributions within specialized fields of research is more considerable and sophisticated today.

Research and development expenditure figures from the OECD for our focus group of countries in 1995 show some variation in the patterns of spending across countries. The percent of total R&D spending at higher education institutions that was derived from government sources ranged from 52 percent in Japan to 92 percent in Italy and Switzerland (1992 data). The majority of research funds at higher education institutions derived from government sources in all countries. The proportion of total R&D spending that was manifest at higher education institutions, however, ranged from just 15 percent in Japan to 32 percent in Spain. Measured on a *per capita* basis, the United States spent more on R&D at higher education institutions than did any other country, except Sweden.

REFERENCES

REFERENCES

Altbach, P.G., (Ed.). (1991). International higher education: An encyclopedia. New York: Garland Publishing.

Anchor atlas of world history, volume I. (1974). Garden City, New York: Anchor Books.

Arimoto, A. (1992). Japan. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 443-454). Houston, Texas: American Collegiate Service.

Avis, G. (1991). Soviet Union. In P. G. Altbach (Ed.), International higher education (pp. 781-798). New York: Garland Publishing, Inc.

Baba, Mashtero. (undated). Private funding versus government funding in Japanese universities. Unpublished manuscript, Shinshu University.

Bania, N., Eberts, R., & Fogarty, M. (1987, July). The role of technical capital in regional growth. Paper presented at the Western Economic Association Meeting.

Bélanger, C. H., & Lyck, L. (1995). Outlying universities and the Swiss army pocket knife. Higher Education Management, 7 (2), 221-228.

Bienaymé, A. (1991). France. In P. G. Altbach (Ed.), International higher education (pp. 657-669). New York: Garland Publishing, Inc.

Best, F. (1992). France. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 263-269). Houston, Texas: American Collegiate Service.

Brubacher, J.S., & Rudy, W. (1976). Higher education in transition: A history of American colleges and universities, 1636—1976 (3rd ed.). New York: Harper and Row.

Burtless, G., Ed. (1997) Does money matter? The effect of school resources on student achievement and adult success. Washington, D.C.: Brookings Institution.

Carlton, D.W. (1983). The location and employment choices of new firms: An econometric model with discrete and continuous endogenous variables. Review of Economics and Statistics, 65, 440-449.

Cian, D.O. (1992). Italy. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 429-434). Houston, Texas: American Collegiate Service.

DAEU: le diplome de la seconde chance. (1996, October). Le Monde de l' Education, 241, 81-84.

Davis, Todd M., Ed. (1996) Open Doors 1995/96. New York: Institute for International Education.

Dahllof, U.S. (1992). Sweden. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 743-750). Houston, Texas: American Collegiate Service.

de l'Ain, B.G. (1997). The future of European universities. Higher Education Management, 9(1), 85-104.

de Gaudemar, J. (1997). The higher education institution as a regional actor. Higher Education Management, 9(2), 53-64.

Der Bundesminister fur Bildung und Wissenschaft. (1992). Grund-und structur daten, 1992-93. Bonn: Author.

Frackmann, E. (1991). Perspectives on financing higher education in Germany. (1991). Higher Education Management, 3(3), 226-238.

Garke, E. (1992). Switzerland. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 751-758). Houston, Texas: American Collegiate Service.

Garrido, J.L.G. (1991). Spain. In P. G. Altbach (Ed.), International higher education (pp. 799-809). New York: Garland Publishing, Inc.

Geiger, R.L. (1991). Private higher education. In P. G. Altbach (Ed.), International higher education (pp. 233-246). New York: Garland Publishing, Inc.

Harman, G. (1991). Australia. In P. G. Altbach (Ed.), International higher education (pp. 593-603). New York: Garland Publishing, Inc.

Hartmann, W. (1992). Federal Republic of Germany. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 277-295). Houston, Texas: American Collegiate Service.

Hill, B.V. (1992). Australia. In W. Wichremasinghe (Ed.), Handbook of world education (pp. 25-33). Houston, Texas: American Collegiate Service.

International encyclopedia of national systems of education (2nd ed.). (1996). Oxford: Pergamon Press.

Jaffe, A.B. (1989). Real effects of academic research. American Economic Review,79(5), 957-970.

Johnstone, D.B. (1991). The costs of higher education. In P. G. Altbach (Ed.), International higher education (pp. 59-89). New York: Garland Publishing, Inc.

Jouandreau, A. (1996). Why higher education needs a quality system. Higher Education Management, 8(3), 69-77.

Kennedy, S. (1995). Liberté, egalité, fraternité…et lisibilité! International Educator, 5(1), 30-40.

Koretz, D.M. (1991). State comparisons using NAEP. Educational Researcher, 20(3), April.

Kitamura, K. (1991). Japan. In P. G. Altbach (Ed.), International higher education (pp. 489-499). New York: Garland Publishing, Inc.

Kogan, M. (1995). Keynote speeches at the twelfth general conference of IMHE member institutions. Higher Education Management, 7(2), 151-155.

Lane, J. (1991). Sweden. In P. G. Altbach (Ed.), International Higher Education (pp. 811-824). New York: Garland Publishing, Inc.

Leroux, J. (1997). France: First cycle university courses in the context of mass higher education. Higher Education Management, 9(1), 117-126.

LeVasseur, P.M. (1996). 1970-1995: An IMHE perspective on higher education in transition. Higher Education Management, 8(3), 7-14.

McDaniel, O.C. (1997). Alternatives to government interference in higher education. Higher Education Management, 9(2), 115-133.

Ministry of Education, Science, Sports, and Culture, Government of Japan. (1996). Monbusho. Tokyo: Author.

Moodie, G.C. (1991). United Kingdom. In P. G. Altbach (Ed.), International Higher Education (pp. 825-836). New York: Garland Publishing, Inc.

Moscati, R. (1991). Italy. In P. G. Altbach (Ed.), International Higher Education (pp. 721-733). New York: Garland Publishing, Inc.

National Center on Education and the Economy (1990). America's Choice: High Skills or Low Wages: Report of the Commission on the Skills of the American Workforce. Rochester, N.Y.: Author.

National Science Board. (1996). Science and Engineering Indicators 1996. Washington, D.C.: Author.

Naumann, J., & Krais, B. (1991). German Federal Republic. In P. G. Altbach (Ed.), International Higher Education (pp. 685-705). New York: Garland Publishing, Inc.

Neave, G. (1996). Higher education in transition: Twenty-five years on. Higher Education Management, 8(3), 15-24.

Oliva, F.D. (1992). Canada. In W. Wichremasinghe (Ed.), Handbook of world Education (pp. 145-153). Houston, Texas: American Collegiate Service.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1987). Universities under scrutiny. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1990). Financing higher education: Current patterns. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1991). Alternatives to universities. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and

Innovation. (1995). Education at a glance: OECD indicators. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1996). Education at a glance: OECD indicators. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1996). Indicators of education systems, eighth technical group meeting, comparisons of quantitative indicators. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1996). Reviews of national policies for education: France. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1997). Education at a glance: OECD indicators. Paris: Author.

Organization for Economic Co-operation and Development, Center for Educational Research and Innovation. (1998). Reviews of national policies for education: Russian Federation. Paris: Author.

Peisert H., & Framhein, G. (1990). Higher education in the Federal Republic of Germany. Bonn, Germany: Federal Ministry of Education and Science.

Perkin, H. (1991). History of universities. In P. G. Altbach (Ed.), International Higher Education (pp. 169-204). New York: Garland Publishing, Inc.

Phelps, R.P. (1996). Are U.S. students the most heavily tested on earth? Education Measurement: Issues and Practice, 15(3), 19-27.

Phelps, R.P. (1998). The effect of university host community size on state growth. Economics of Education Review, 17(2).

Postlethwaite, T.N., Ed. (1995). International Encyclopedia of National Systems of Education (2nd Ed.). New York: Pergamon.

Rinehart, N. (1995). Reassembling the universities of the former German Democratic Republic. International Educator, 5(1), 15-18.

Sanyal, B.C. (1991). Higher education and the labor market. In P. G. Altbach (Ed.), International Higher Education (pp. 147-168). New York: Garland Publishing, Inc.

Savelyev, A.Y. (1992). Union of Soviet Socialist Republics. In W. Wichremasinghe, W. (Ed.), Handbook of world education (pp. 827-835). Houston, Texas: American Collegiate Service.

Shattock, M. (1995). The university of the future. Higher Education Management, 7(2), 157-164.

Shils, E. (1991). Academic freedom. In P. G. Altbach (Ed.), International Higher Education (pp. 1-25). New York: Garland Publishing, Inc.

Skolnik, M.L. (1991). Canada. In P. G. Altbach (Ed.), International Higher Education (pp. 1067-1080). New York: Garland Publishing, Inc.

Teichler, U. (1996). Higher education and employment: Twenty-five years of changing debates and realities. Higher Education Management, 8(3), 25-37.

Tsaoussis, D. (1995). The university in the emerging new european post-compulsory educational system. Higher Education Management, 7(2), 171-179.

Underwood, K., & de Broucker, P. (1997). An indicator of equity: The probability of attaining a post-secondary credential by the level of parents' education. Statistics Canada, Centre for Education Statistics.

United Nations Education, Science, and Cultural Organization. (1994). Statistical yearbook. New York: Author.

United Nations Education, Science, and Cultural Organization. (1996). Statistical yearbook. New York: Author.

U.S. Department of Education, National Center for Education Statistics. (1993). 120 years of american education: A statistical portrait, by Snyder, T. Washington, D.C.

U.S. Education Department, National Center for Education Statistics. (1996). Education in states and nations (2nd ed.), NCES 96-160, by Phelps, R., Smith, T., & Alsalam, M. Washington, D.C.

U.S. Department of Education, National Center for Education Statistics. (1996). Education indicators: An international perspective, NCES 96-003, by Matheson, N., Salganik, L., Phelps, R., Perie, M., Alsalam, N., and Smith, T. Washington, D.C.

U.S. Department of Education, National Center for Education Statistics. (1997). The digest of education statistics, 1997, by Snyder, T. and Hoffman, C. Washington, D.C.

U.S. Department of Education, National Center for Education Statistics. (1997). International education expenditure comparability study: Final report, volume I, by Barro, S.M., Project Officer: Burns, S. Washington, D.C.

U.S. Department of Education, National Center for Education Statistics. (1997). International education expenditure comparability study: Final report, volume II. by Sherman, J.D., Phelps, R.P., and Burns, S. Washington, D.C.

U.S. Department of Education, National Center for Education Statistics. (1998). The condition of education, 1998. Washington, D.C.

Vincente, C.V. (1992). Spain. In W. Wichremasinghe, W. (Ed.), Handbook of world education (pp. 711-720). Houston, Texas: American Collegiate Service.

Wichremasinghe, W., (Ed.). (1992). Handbook of world education. Houston: American Collegiate Service.

Wagner, A. (1996). Financing higher education: New approaches, new issues. Higher Education Management, 8(1), pp. 7-17.

Williams, G. (1996). The many faces of privatisation. Higher Education Management, 8(3), 39-57.

Williams, M.T., & Jones, G.E. (1992). United Kingdom. Handbook of World Education (pp. 845-856). Houston, Texas: American Collegiate Service.

Worgan, P. (1995). The changing relationship between the state and higher education in the Czech Republic. Higher Education Management, 7(2), 241-252.

World Almanac. (1995). World almanac and book of facts, 1995. Mahwah, New Jersey: Author.

World Bank, ECA Country Department III, Human Resources Division. (1995). Russia: Education in transition. Washington, D.C.: Author.

Table A.1: Typical graduation age, by level of higher education

	Non-university (ISCED 5)	University-level education, first stage (ISCED 6)		University-level education, second stage (ISCED 7)	
Country	All programs	Short programs	Long programs	Second Programs (e.g. U.S. Master's)	Ph.D. equivalent
Australia	20	21	x	24	25
Austria	20-22	a	22-25	a	24-27
Belgium	21-23	a	22-24	23-26	26-30
Canada	21	22	x	24	27
Czech Republic	21-22	21-22	23-25	a	26-28
Denmark	23-24	25-27	25-27	26-27	29-35
Finland	21-22	22-24	25-26	25-26	29-30
France	20-21	a	22	a	26
Germany	21	a	26	a	29-31
Greece	20-22	a	22-24	23-24	25-27
Hungary	a	21-22	23-24	26-28	a
Iceland	23	23	25	25-28	29-35
Ireland	19-21	20-22	23-24	21-24	24-27
Italy	21	22	23	a	25
Japan	20	a	22	24	27
Korea	20	22	x	24	29
Luxembourg	21-22	a*	a*	a*	a*
Mexico	23	x	23	26	28
Netherlands	a	a	23	25	28
New Zealand	21	21	x	23	25
Norway	20-21	23	24	24-28	25-29
Poland	20-22	22-23	23-26	24-26	27-29
Portugal	21-22	21-22	22-24	24	26-27
Russian Federation	19-20	20-23	22-25	a	26
Spain	20	21	23	x	26-28
Sweden	20-22	22	23-24	24-27	26-29
Switzerland	23-29	a	26	a	31
Turkey	19	a	25-27	25-27	25-27
United Kingdom	20	21	x	22	26
United States	20	22	a	24	27

*In Luxembourg, only the first year of university studies can be taken. Afterwards, students have to continue their university studies in foreign countries.

a = Data not applicable.

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table X1.2a.

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Table A.2: Country financial statistics (reference period: calendar year 1994)

Country	Gross Domestic Product (in millions of national currency)	Exchange rates: Purchasing power parity exchange rate	Exchange rates: Unadjusted market exchange rate	Exchange rates: Comparative price levels of GDP	Gross Domestic Product (in millions of dollars, adjusted by market exchange rate)	Total public expenditure (in millions of dollars, adjusted by market exchange rate)	Adjustment factor
Australia	443,020	1.35	1.42	0.95	$312,172	m	1.006715
Austria	2,262,917	13.95	11.42	1.22	198,123	$103,894	1
Belgium	7,678,129	37.36	33.46	1.12	229,496	128,651	1
Canada	740,129	1.25	1.37	0.91	541,965	266,214	1.005452
Czech Republic	1,037,500	11.30	28.79	0.39	36,043	16,082	1
Denmark	928,597	8.73	6.36	1.37	145,992	92,790	1
Finland	509,924	6.16	5.22	1.18	97,621	59,425	1
France	7,389,654	6.64	5.55	1.20	1,330,990	724,462	1
Germany	3,320,400	2.07	1.62	1.28	2,046,106	1,016,342	1
Greece	23,755,806	196.59	242.60	0.81	97,920	34,387	1
Hungary	4,364,800	67.50	105.16	0.64	41,506	13,601	1
Iceland	434,525	84.22	69.94	1.20	6,212	2,531	1
Ireland	36,051	0.64	0.67	0.96	53,918	22,411	1
Italy	1,640,000,000	1,536.39	1,612.44	0.95	1,017,092	553,819	1
Japan	479,000,000	181.09	102.21	1.77	4,686,430	1,633,891	1.002131
Korea	306,000,000	661.50	803.45	0.82	380,858	80,437	1
Luxembourg	487,671	40.08	33.46	1.20	14,576	m	1
Mexico	1,420,159	1.95	3.38	0.58	420,775	73,959	1
Netherlands	612,980	2.13	1.82	1.17	336,804	187,380	1
New Zealand	84,481	1.51	1.73	0.87	48,903	18,221	1.009488
Norway	869,742	9.14	7.06	1.29	123,235	64,189	1
Poland	210,407	1.09	2.27	0.48	92,596	30,278	1
Portugal	14,082,597	118.34	165.99	0.71	84,838	m	1
Russian Federation	611,000,000	912.10	m	m	m	m	1
Spain	64,698,800	121.55	133.96	0.91	482,978	188,691	1
Sweden	1,531,102	9.92	7.72	1.29	198,433	138,661	1
Switzerland	352,920	2.10	1.37	1.54	258,039	94,538	1
Turkey	3,870,000,000	12,116.16	29,608.70	0.41	130,705	30,363	1
United Kingdom	665,570	0.65	0.65	0.99	1,018,584	459,156	1.014424
United States	6,649,800	1.00	1.00	1.00	6,649,800	2,397,400	1.011397

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table X2.1, p.352.

GDP per capita (in equivalent US dollars converted using PPPs)
$18,516
20,206
20,316
20,298
8,883
20,445
16,273
19,233
19,668
11,590
6,302
19,324
15,783
18,648
21,170
10,405
30,116
7,822
18,724
15,959
21,954
5,008
12,018
45,232
13,596
17,582
23,859
5,271
17,622
25,512

Table A.3: Typical cumulative years of schooling by level of education

Country	Non-university	University
Australia	15	16
Austria	15	19
Belgium	15	16
Canada	15	16
Czech Republic	15	17
Denmark	14	18
Finland	14	17
France	14	16
Germany	15	19
Greece	16	16
Hungary	14	17
Iceland	17	18
Ireland	16	17
Italy	15	19
Luxembourg	16	m
Netherlands	a	17
New Zealand	15	16
Norway	14	16
Portugal	14	16
Spain	14	17
Sweden	14	16
Switzerland	16	19
Turkey	14	16
United Kingdom	16	17
United States	14	16

a = Data not applicable.

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators,* 1997, Table x1.1.

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Table A.4: Typical starting age, by level of higher education

Country	Non-university (ISCED 5)	University level, first stage (ISCED 6)	University-level, second stage (ISCED 7)
Australia	18	18	22
Austria	18-19	18-19	22-25
Belgium	18-19	18-19	22-24
Canada	18	18	22
Czech Republic	18-19	18-19	23-25
Denmark	21-22	19-23	19-26
Finland	19-20	19-20	21-23
France	18-19	18	21
Germany	19	19	26
Greece	18-19	18-19	22-24
Hungary	18	18-19	23-25
Iceland	20	20	24
Ireland	17-18	17-18	20-24
Italy	19	19	23
Japan	18	18	22
Korea	18	18	22
Luxembourg	19	19	a
Mexico	18	18	24
Netherlands	a	18	19
New Zealand	18	18	21
Norway	19	19	m
Poland	19	19-20	22-26
Portugal	18	18	22
Russian Federation	15-18	17-19	22-25
Spain	18	18	22-24
Sweden	19	19	22-24
Switzerland	19-25	20	26
Turkey	17	17	21
United Kingdom	18	18	21
United States	18	18	22

a = Data not applicable.

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table X1.2a.

Table A.5: Typical graduation age, upper secondary level, first educational programs

Country	All programs	General programs	Vocational and technical programs	School-based vocational and technical programs	Combined school and work based vocational and technical programs
Australia	19	18	20	20	20
Austria	17-19	18	17-19	17-19	18-19
Belgium	18-20	18	18-20	18-20	18-20
Canada	18	m	m	m	m
Czech Republic	18-19	18-19	18-19	18-19	17-19
Denmark	19-22	19-20	19-22	19-22	19-22
Finland	19	19	18-19	18-19	18-19
France	18-20	18	18-20	18-20	18-20
Germany	19	19	19	19	19
Greece	18-19	18-19	18-19	18-19	a
Hungary	17-18	18	17-18	18	17
Iceland	20	20	20	20	20
Ireland	17-18	17-18	17-18	17-18	17-18
Italy	17-19	19	17-19	17-19	a
Japan	18	18	18	18	a
Korea	18	18	18	18	18
Luxembourg	18-19	19	18-19	18-19	18-19
Mexico	18	18	18	18	a
Netherlands	18-19	18-19	19-20	19	18-21
New Zealand	18	18	18	18	a
Norway	19	19	19	19	19
Poland	18-20	19	18-20	18-20	18-20
Portugal	18	17	18	18	18
Russian Federation	18	17	18	18	a
Spain	16-18	17-18	16-18	16-18	18
Sweden	19	19	19	19	a
Switzerland	18-20	18-20	18-20	18-20	18-20
Turkey	17	17	17-19	17-19	17-18
United Kingdom	16-18	16-18	18	18	18
United States	18	m	m	m	m

a = Data not applicable.

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development. *Education at a Glance: OECD Indicators*, 1997, Table X1.2b.

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Table A.6: Typical graduation age, upper secondary level, second educational programs

Country	All programs	General programs	Vocational and technical programs	School-based vocational and technical programs	Combined school and work-based vocational and technical programs
Austria	18-20	a	18-20	18-20	a
Czech Republic	21-23	a	21-23	21-23	21-23
Denmark	22-23	22-23	22-23	22-23	22-23
Finland	20-21	21	20-21	20-21	20-21
France	19-20	a	19-20	19-20	19-20
Germany	22	25	22	22	22
Hungary	19-21	20	20	21	19
Iceland	20	20	20	20	20
Ireland	18-19	a	18-19	18-19	18-19
Italy	19	a	19	a	19
Netherlands	19-20	19	20	20	20
Portugal	18	18	18	18	18
Spain	19	a	19	a	19

a = Data not applicable.

Note: Only countries which report second or further educational programs at the upper secondary level are listed.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table X1.2c

Table A.7: Background information on eligibility requirements for upper secondary and higher education scholarships and grants: 1994-1995

	Scholarships/Grants				
		Eligibility dependent on			
Country	Related to progress	Student's income	Parents' income	Partner's income	
Australia	no	yes	yes	yes	
Austria	yes	yes	yes	yes	
Belgium, Flemish	yes	yes	yes	yes	[1]
Canada	yes	yes	yes	yes	[2]
Czech Republic	no	yes	yes	yes	[3]
Denmark	yes	yes	yes	no	[4]
Finland	yes	yes/no	yes/no	no	[5]
France	yes	yes	yes	yes	[6]
Germany	yes	yes	yes	yes	[7]
Greece	yes	no	yes	no	[8]
Ireland	yes	yes	yes	yes	[9]
Mexico	yes	yes	yes	yes	[10]
Netherlands	yes	no	yes	no	[11]
New Zealand	yes	yes	yes	yes	[12]
Norway	yes	yes	yes	no	[13]
Spain	yes	yes	yes	yes	
Sweden	yes	yes	no	yes	[14]
Switzerland	yes/no	yes	yes	yes	[15]
United Kingdom	no	yes	yes	yes	[16]
United States	no	yes	yes	yes	[17]

[1] Related to progress only for scholarships at the secondary level when the student is no longer of school age, and at the higher education level.

[2] No tuition fees for public primary and secondary institutions.

[3] No tuition fees for public institutions; eligibility depends on total income of student's family.

[4] No tuition fees for public institutions; eligibility based on parents' income for students aged 18-19.

[5] No tuition fees for public institutions; if student works outside academic year, income has no effect on scholarship; parents income has effect at age 17-19.

[6] The relationship to academic progress only pertains for scholarships at the higher education level.

[7] No tuition fees for public institutions; within higher education, eligibility related to certified progress. Maximum duration of scholarships/grants limited to the theoretical duration of study.

[8] No tuition fees for public institutions.

[9] Eligibility depends on student's and partner's income only if student is over 23; In upper secondary only a few institutions charge fees.

[10] These criteria for eligibility pertain to higher education level only.

[11] Related to progress in higher education.

[12] Eligibility depends on parents' income if student is under 25 and single; grants are also related to student progress; eligibility and relation to student progress for scholarships vary according to scholarship under consideration.

[13] Eligibility depends on parents' income if student is under 19 in upper secondary education; in public higher education, institutions may ask a small term fee for running of student welfare activities.

[14] No tuition fees.

[15] Depends on canton.

[16] Eligibility mainly dependent on parents' income; students aged over 25 have their own income taken into account.

[17] Eligibility not specifically dependent on student progress, but if a student fails or does not maintain a certain average, could lose scholarship; no tuition fees for upper secondary except at private schools.

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NOTE: Loans can include subsidies to cover interest on private loans. Scholarships or grants may consist of subsidies for housing, meals, transport, medical expenses, books and supplies, social and recreational purposes. For Australia, Austria, Finland, Germany: values for certain sub-categories of specific subsidies are missing
SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B3.3.

Table A.8: Degrees and degree programs, by country

							National degree/qualification structure					Requirements				IN EAG	
	Degree or qualification	Entry requirement	Duration	Cum-ulative duration	P/T	Equivalent to a university degree	Inter-mediate	1st	2nd	3rd	Fields of study (if specific to degree)	Advanced research	Disser-tation	Pub-lished work	Notes	R12 cate-gories (see below)	Verified by country
AUSTRALIA																	1
A1	Certificate I	Year 10	1	1	1											A	
A2	Certificate II	Year 10	1		1											A	
A3	Certificate III	Year 10 to year 12	3	4	1										Tends to include trades	A	
A4	Certificate IV	Year 12	4	4	1										Supervisory courses	A	
A5	Diploma	Year 12	2	2							Hospitality industry and design and some areas of applied science and technology					A	
A6	Advanced diploma	Year 12	3	3							Paraprofessional					A	
A7	Bachelor's degree (pass)	Higher school certificate, university examination, school-leaving certificate	3,4	3		1		1			Arts, science, economics, applied science, nursing, etc.				Most degrees take three years, though an increasing number are taking four years. The longer degrees are mainly vocationally oriented courses.	B	
A8	Bachelor's degree (honors)	Higher school certificate, university examination, school-leaving certificate	4	4		1		1			Arts, science, economics, applied science, nursing, etc.					B	
A9	Bachelor of engineering	Higher school certificate, university examination, school-leaving certificate	4	4		1		1								B	
A10	Bachelor's degree (veterinary, medicine, dentistry, architecture)	Higher school certificate, university examination, school-leaving certificate	5	5		1		1			Veterinarian medicine, dentistry, architecture					C	
A11	Bachelor's degree (medicine & surgery)*	Higher school certificate, university examination, school-leaving certificate	7	7		1		1			Medicine and surgery					C	
A12	Graduate certificate	Bachelor's degree (pass)	1	4		1			1		Management, business, administration					D	
A13	Graduate diploma	Bachelor's degree (pass)	2	6		1			1							D	
A14	Master's degree (pass)	Bachelor's degree (pass)	1	5		1			1						A bachelor's (honors) is required for master's by research	D	
A15	Master's degree (honors)	Bachelor's degree (honors)	2	6		1			1							D	
A16	Doctor of philosophy (Ph.D.)	Bachelor's degree (honors) or master's	3 to 5	7 to 9		1				1		1	1			E	
A17	Higher doctorate in science (D.Sc.) or humanities (D.Lit.)	Doctor of philosophy (Ph.D.)		10+		1				4th		1		1		E	

* Some universities offer a bachelor of medicine and surgery as a 4 year second degree, the entrance requirement being a bachelor's degree (3 yrs). Cumulative duration remains 7 years.

CANADA																	1
CA1	Diploma	Secondary school certificate usually required	1	1							Career oriented professional & semi-professional programs					A	
CA2	Certificate	Secondary school certificate usually required	2+	2+							Career oriented professional & semi-professional programs					A	
CA3	Bachelor's degree (general or pass)	Secondary school diploma (12 years, 13 years in Quebec and Ontario)	3	3	1			1					1*			B	
CA4	Bachelor's degree (honors), baccalaureat	Secondary school diploma (12 years, 13 years in Quebec and Ontario)	4	4	1			1					1	**		B	
CA5	First professional degree	Secondary school diploma (12 years, 13 years in Quebec and Ontario)	5 to 7***	5 to 7	1			1			Dentistry, law, medicine, architecture					C	

R12 Categories
A=Non-university, tertiary
B=1st university short (<=4)
C=1st university long (>4)
D=2nd university degree
E=Advanced research qualification
N=Not included

P/T = part-time
1 = Yes

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University and non-university higher education degrees awarded in selected countries

CA6	Master's degree, maitrise	Bachelor's degree (honors)	1 or 2	5 or 6	1				1			1*			* Some require thesis but not all	D*	
							National degree/qualification structure					Requirements				IN EAG	
	Degree or qualification	Entry requirement	Duration	Cumulative duration	P/T	Equivalent to a university degree	Inter-mediate	1st	2nd	3rd	Fields of study (if specific to degree)	Advanced research	Disser-tation	Pub-lished work	Notes	R12 cate-gories (see below)	Verified by country
CA7	Doctorate, doctorat	Master's degree	3 to 5	8 to 11	1					1		1			** Requires thesis to be deposited in library of institution of study	E	
FRANCE																	1
FR1	Brevet de technician superieure (BTS)	Baccalaureat or brevet de technician	2	2											Holders of a BTS may, in certain conditions, continue their studies at university or higher schools	A	
FR2	Diplome universitaire de technologie (DUT)	Baccalaureat or equivalent	2	2											Short course in technology offered by a universoty institute of technology. Holders of a DUT may, in certain conditions, continue their studies in a university program	A	
FR3	Diplome ecoles superieures specialisees	Baccalaureat or equivalent	2	2							Social work				Final qualification	A	
FR4	Diplome d'etudes universitaires scientifiques et techniques (DUEST)	Baccalaureat or equivalent	2	2											Final qualification	N	
FR5	Diplome d'etudes universitaires generales (DUEG)	Baccalaureat or equivalent	2	2			1				Arts and human sciences, law, economics				First cycle of a university program	N	
FR6	License	DEUG or DUT	1	3		1		1			Humanities, law, science, economics					N	
FR7	Maitrise	License	1	4		1			1		Humanities, law, science, economics					C	
FR8	Diplome ecoles superieures specialisees	Baccalaureat or equivalent	5	5		1		1			Architecture, engineering, pharmacy, political studies				Award often serves as a professional qualification	C	
FR9	Diplome (of school of particular subject)	Baccalaureat or equivalent, entrance examination after 1 to 3 years of post-baccalaureat preparatory classes	3	5		1		1							Award often serves as a professional qualification	C	
FR10	Magistere	DEUG or DUT	3	5		1		1							University diploma, multi-disciplinary in content	C	
FR11	Diplome d'etudes superieures specialisees (DESS)	Maitrise	1	5		1				1					Professionally oriented final qualification awarded after a year of research work	E	
FR12	Diplome d'etudes approfondies (DEA)	Maitrise	1	5		1				1		1			First year of a 3 year program involving a high degree of specialization after training in research	E	
FR13	Docteur en chirugie dentaire, docteur en pharmacie, docteur en medecine	Baccalaureat or equivalent	5 to 8	5 to 8		1		1			Dentistry (5yrs), pharmacy (6yrs), veterinary medicine (6yrs), medicine (8yrs)		1		Awarded at the end of professional training and the submission of a *these de doctorat d'exercise de la profession*	C	
FR14	Certificats d'etudes specialisees (CES)	Docteur en chirugie dentaire, Docteur en pharmacie	1	6 or 7		1			1		Dentistry and pharmacy				Postgraduate specialized training	E	
FR15	Diplome d'etudes specialisees (DES)	Docteur en medecine	1	9		1			1		Medicine				Postgraduate specialized training	E	

P/T = part-time
1 = Yes

R12 Categories
A=Non-university, tertiary
B=1st university short (<=4)
C=1st university long (>4)
D=2nd university degree
E=Advanced research qualification
N=Not included

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University and non-university higher education degrees awarded in selected countries

FR16	Doctorat	Diplome d'etudes approfondies (DEA)	3	9		1				4th		1	1		Awarded after the submission of a thesis based on original research	E	
							National degree/qualification structure					Requirements				IN EAG:	
	Degree or qualification	Entry requirement	Duration	Cumulative duration	P/T	Equivalent to a university degree	Inter-mediate	1st	2nd	3rd	Fields of study (if specific to degree)	Advanced research	Disser-tation	Pub-lished work	Notes	R12 cate-gories (see below)	Verified by country
FR17	Habilitation a diriger des recherches	Doctorat	3	12		1				5th			1	1	Diploma awarded to doctorat holders who have proved their ability to carry out original research of a high order and to supervise young researchers	N	
GERMANY																	1
GE1	Meister/techniker, qualification of trade and technical schools	Successful completion of vocational upper secondary (dual system)	1 to 4	1 to 4	1										Most programs require prior work experience. 3 and 4 year programs are mainly part-time	A	
GE2	Qualification of specialized academies	Realschulabshluss	2	2							Mainly kindergarten teaching, business administration, language translation				only in Bavaria	A	
GE3	Qualification of vocational academies	Hochschulreife	3	3											Only in lower Saxony and Schleswigholstein	A	
GE4	Qualifications of health schools	Completion of lower secondary general + prior vocational experience + minimum age 18	1 to 3	1 to 3							Non-academic medical training				Duration varies by specialization: 1 year: auxiliary medical professions; 2 years: medical assistants; 3 years: nurses	A	
GE5	Diplom (Fachhochschulen)	Fachhochschulreife	4 to 5	4 to 5		1		1								C	
GE6	Diplom (university) & similar degrees	Hochschulreife	5 to 7	5 to 7		1		1							Includes Magister, Staatsprufung, Kunstlerischer Abschluss, Kirchlicher Abschluss	C	
GE7	Lehramtsprufung	Hochschulreife	5 to 7	5 to 7		1		1			Field of study depends on subjects chosen for teaching				Teaching qualifaction, degree for teachers	C	
GE8	Promotion	First university degree	2 to 3	7 to 10		1			1			1				E	
ITALY																	
IT1	Diploma universatario (Laurea breve)	Maturita	2 to 3	2 to 3		1	1				Economics, chemistry, engineering, medicine		1			B	
IT2	Licenza accademia di belle arti	Maturita	4	4				1			Fine arts		1	1		A	
IT3	Diploma di Laurea	Maturita	4	4		1		1			Arts, law, political science, biology, philosophy, and most other courses		1	1		B	
IT4	Diploma di Laurea	Maturita	5	5		1		1			Agriculture, architecture, chemistry, dentistry, engineering, psychology, veterinary medicine		1			C	
IT5	Diploma di Laurea	Maturita	6	6		1			1		Medicine		1			C	
IT6	Diploma di specialista	Laurea	2 to 5	6 to 11		1				1			1			D	
IT7	Dottorato di ricerca	Laurea	3	7 to 14		1				1		1	1			E	
JAPAN																	1
JA1	Jungakushi (associate)	Upper secondary	2 to 3	2 to 3												A	
JA2	Gakushi (bachelor)	Upper secondary	4	4		1		1					1			B	

P/T = part-time
1 = Yes

R12 Categories
A=Non-university, tertiary
B=1st university short (<=4)
C=1st university long (>4)
D=2nd university degree
E=Advanced research qualification
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University and non-university higher education degrees awarded in selected countries

JA3	Gakushi (bachelor–medicine, veterinary medicine, and dentistry)	Upper secondary	6	6		1		1			Medicine, veterinary medicine, and dentistry		1			C	
							National degree/qualification structure					Requirements				IN EAG	
	Degree or qualification	Entry requirement	Duration	Cumulative duration	P/T	Equivalent to a university degree	Inter-mediate	1st	2nd	3rd	Fields of study (if specific to degree)	Advanced research	Disser-tation	Pub-lished work	Notes	R12 cate-gories (see below)	Verified by country
JA4	Shushi (master)	Gakushi (bachelor)	2	6		1			1				1			D	
JA5	Hakushi (doctor)	Shushi (master)	3	9		1				1		1	1			E	
RUSSIAN FEDERATION																	
RU1	Diploma of incomplete high	11 years secondary school or 12 years of secondary-professional education	2	2			?								Awarded to students who discontinue their studies after two years		
RU2	Specialist's certificate	11 years secondary school or 12 years of secondary-professional education	4	4		1		1			General (humanities, and natural sciences) as well as professional courses				Upon completion of the course, the student is granted the title of specialist in a given specialty		
RU3	Bachelor's degree		4	4		1		1			General humanities, fundamental natural sciences and professionally oriented training in fields covering a wide range of scientific, technological and culural areas						
RU4	Specialist extended-educat	Specialist's certificate	1	5		1			1								
RU5	Master's degree	Bachelor's degree	2	6		1			1								
RU6	Internatura	Bachelor's degree in medicine	1	7		1		1			Medical specialty						
RU7	Kanditat nauk	Master's degree	3	9		1				1		1			Requires public defense of an independently elaborated thesis and by final exmainations		
RU8	Doktor nauk	Kanditat nauk	3	12		1				4th		1			Requires defense of thesis offering new solutions to a major scientific/academic problem which is of substantial importance to the given field or discipline		
SPAIN																	1
SP1	Technico superior	Bachillerato	2	2							Formacion profesional y artes plasticas y diseno					A	
SP2	Diplomado	Bachillerato or formacion profesional	3	3		1		1			Humanidades, soc. y, jurid cc. exper., cc. salud				Orientacion profesional	B	
SP3	Arquitectos technico, ingenieros technico	Bachillerato or formacion profesional	3	3		1		1			Architecture, engineering				Orientacion profesional	B	
SP4	Primer ciclo de lecenciatura, ingenieria y architectura	Bachillerato or formacion profesional	2 or 3	2 or 3		1	1				Humanidades, soc. y, jurid cc. exper., cc. salud, ingeneria, arquitectura				Orientacion academia. Proporciana una certificacion que tiene un reconcimiento profesional equivalente al diplomado, en los concursos del admon publica	N	
SP5	Licenciado e ingeniero	First cycle of law, first cycle of engineering, or technical engineering degree	2 or 3	4 or 5		1			1		Humanidades, soc. y, jurid cc. exper., cc. salud, ingeneria					C	
SP6	Arquitecto	First cycle of architecture	2 or 3	5		1			1		Architecture					C	

P/T = part-time
1 = Yes

R12 Categories
A=Non-university, tertiary
B=1st university short (<=4)
C=1st university long (>4)
D=2nd university degree
E=Advanced research qualification
N=Not included

University and non-university higher education degrees awarded in selected countries

	Degree or qualification	Entry requirement	Duration	Cumulative duration	P/T	Equivalent to a university degree	National degree/qualification structure				Fields of study (if specific to degree)	Requirements			Notes	IN EAG:	Verified by country
							Inter-mediate	1st	2nd	3rd		Advanced research	Disser-tation	Pub-lished work		R12 cate-gories (see below)	
SP7	Licenciado medicina	First cycle of medicine	3	6		1			1		Medicine					C	
SP8	Doctorado	Law, architecture, engineering, or university programs lasting more than 4 years	2	6,7,8		1				1	Engineering, physics & chemistry, mathematics, commercial and economic sciences	1	1		La qualification de doctorado est exigee, au personnel ensignant titulaire d'un contrat stable.	E	
SP9	Post grado y Master	Law, architecture, engineering	1 or 2	6 or 7		1										N	
SP10	Especialidades Sanitarias	Law, medicine, pharmacy, chemistry, biology, or pschology	3 or 4	8 to 10		1										N	
SWEDEN																	1
SW1	Hogskoleexamen (diploma)	12 years secondary-school leaving certificate or be 15 years of age and have four years of professional experience and a good reading knowledge of English	2 to 2.5	2 to 2.5		Some, see note		1							Some programs longer than three years are classified as C/D. The two-year engineering program can be intermediate (though this is infrequent) and continued to a civil engineering degree.	A/B/C/D	
SW2	Kandidatexamen (bachelor's degree)	13 years, secondary-school leaving certificate or be 25 years of age and have 4 years of professional experience and a good reading knowledge of English	3 to 3.5	3 to 3.5		1		1								B	
SW3	Magisterexamen (master's degree)	13 years, secondary-school leaving certificate or be 25 years of age and have 4 years of professional experience and a good reading knowledge of English	4 to 5.5	4 to 5.5		1		1							Counted as category D if earned after a first university degree	C/D	
SW4	Yrkesexamen (professional degrees)	13 years, secondary-school leaving certificate or be 25 years of age and have 4 years of professional experience and a good reading knowledge of English	1 to 5.5	1 to 5.5		Some, see note		1								A/B/C/D	
SW5	Licenciatexamen	Degree of at least 3 years duration	2 to 2.5	5 to 5.5		1	1					1	1	1	All degrees are reported as category E though persons who earn a Doctor's degree afters a Licentiate degree will not be double counted	E	
SW6	Doktorsexamen	Degree of at least 3 years duration	4	7		1			1			1	1	1		E	
SWITZERLAND																	1
CH1	Fachausweis/Brevet (ou certificat equivalent)	13 ans: Certificat de capacite (CITE 3); several years of professional experience	1 a 3	1 a 3											Sont frequents: etudes en cours d'emploi et structures modulaires des etudes; examens organises par des associations professionnelles; titres reconnus par la Confederation.	A	

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C=1st university long (4)
D=2nd university degree
E=Advanced research qualification
[illegible] included

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							National degree/qualification structure					Requirements				IN EAG	
	Degree or qualification	Entry requirement	Duration	Cumulative duration	P/T	Equivalent to a university degree	Inter-mediate	1st	2nd	3rd	Fields of study (if specific to degree)	Advanced research	Disser-tation	Pub-lished work	Notes	R12 cate-gories (see below)	Verified by country
CH2	Fachdiplom/meister//diplome/maitre (or equivalent certificate)	13 years; Certificat de capacite (CITE 3) or Brevet (CITE 5), several years of professional experience	1 to 3	1 to 4											Sont frequents: etudes en cours d'emploi et structures modulaires des etudes, examens organises par des associations professionnelles; titres reconnus par la Confederation	A	
CH3	TechnikerTS/diplom FS//technicien ET or equivalent	13 years. Certificat de capacite (CITE 3) or attestation equivalent	2 to 3	2 to 3											ET = Ecole technique	A	
CH4	Diplom hohere fachschulen/ingenieurschule/diplome ecole superieure/ecole technique superieure	13 years. Certificat de capacite (CITE 3) or Maturite professionnelle ou attestation equivalent	3 to 4	3 to 4											Des 1997, certaines Ecoles superieures seront transfromees en Hautes ecoles specialisees. Plusieurs diplomes post-grade.	A	
CH5	Diplom fachschulen/diplome haute ecole specialisee	13 years, maturite professionnelle or maturite + stage professionnel	3 to 4	3 to 4		1		1							Premieres fondations de Hautes ecoles specialisees en 1997; premiers diplomes seront delivres en 2000.	N (B)	
CH6	Lizentiat universitat/staatsexamen (medezin)/diplom hochschule/license universite/diplome federal (medcine)/diplom haute ecole	13 years, maturite	4 to 6 or 7	4 to 6 or 7		1		1					1		1) Pour la license et le diplome, un travail scientifique est requis de 50 a 200 pages. Plusieurs deplomes post-grade.	C	
CH7	Doktorat/doctorat	License universite, diplome haute ecole, diplome federal (medecine)	1 to 5	5 to 11		1			1			1	1	1		E	
UNITED KINGDOM																	1
UK1	Higher national certificate	13 years, general certificate of education	1	1							Technical subjects					A	
UK2	Higher national diploma	13 years, general certificate of education	2	2							Technical subjects					A	
UK3	National vocational qualification-level 4	13 years, general certificate of education	Variable	Variable	1	Some					Technical subjects				Considered of equivalent standard to secondary/higher degree qualifications	N	
UK4	Bachelor's degree	13 years, general certificate of education	3 (most often) or 4	3		1		1							An *honors degree* is at a higher level than an *ordinary* or *pass* degree. May include a sandwich course which incorporates periods of industrial training or professional experience outside the university	B	
UK5	Bachelor's degree (MB, BDS, BV, etc.)	13 years, general certificate of education	5 to 7	5 to 7		1		1			Medicine, veterinary medicine, and dentistry					B (should be C)	
UK6	National vocational qualification-level 5	13 years, general certificate of education	Variable	Variable	1	1					Technical subjects				Considered of equivalent standard to sub-degree and first degree qualifications	N	
UK7	Postgraduate diplomas and certificates (e.g., DipSW, PDA (Scotland only))	Bachelor's degree	1	4		1		1	1							D	

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N=Not included

							National degree/qualification structure					Requirements				IN EAG:	
	Degree or qualification	Entry requirement	Duration	Cumulative duration	P/T	Equivalent to a university degree	Inter-mediate	1st	2nd	3rd	Fields of study (if specific to degree)	Advanced research	Disser-tation	Pub-lished work	Notes	R12 cate-gories (see below)	Verified by country
UK8	Many professional qualifications in various fields	Bachelor's degree	1 to 3	4 to 6		1		1	1		e.g., accounting, law, audit, architecture (CIMA, articles, architecture Part III)				Training takes place on the job, but certification usually involves taking an examination and cerification through a professional body. Only qualifications earned at educational institutions are included in UOE	**D or Not Included**	
UK9	Master's degree (taught, e.g., MA, MSc, MBA)	Bachelor's degree (honors)	1 to 2	4 to 5		1			1				1		Award based on a written examination requires a memoir or short thesis	**D**	
UK10	Master's degree (research, e.g., Mphil)	Bachelor's degree (honors)	1 to 2	4 to 5		1			1			1	1		Award based on research and presentation of a thesis	**D, but should be E**	
UK11	Doctorate of philosophy (PhD)	Bachelor's degree (honors)	4	7 to 9		1				1		1	1			**E**	

UNITED STATES																	1
US1	Postsecondary awards, certificates, and diplomas	Typically 12 years, high school diploma or equivalent (not always required)	1 to 4	1 to 4											Certificate is usually a final qualification for technicians	**A**	
US2	Associate of arts (A.A.) or Associate of science (A.S.) degree	Typically 12 years, high school diploma or equivalent (not always required)	2	2			1								Possible to receive credit for first 2 years of a bachelor program	**A**	
US3	Bachelor of arts (B.A.) or Bachelor of science (B.S.) degree	12 years, high school diploma or equivalent	4	4		1		1							Two components: general education (humanities, social sciences, applied or natural sciences and fine arts) and an area of specialization or major	**B**	
US4	Postgraduate certificates (e.g., teaching credential)	Bachelor's degree	1	5		1			1							**N**	
US5	Master of arts, science, fine arts, etc. (M.A., M.S., M.F.A.)	Bachelor's degree	1 to 2	5 to 6		1			1		Liberal arts and sciences		1		Duration varies by field and institution	**D**	
US6	Master of business administration, public administration, public health, etc.)	Bachelor's degree	1 to 2	5 to 6		1			1		Business administration, public adminstration, public health, education fine arts, social work				Awarded for the completion of a professionally oriented program	**D**	
US7	First professional degrees: juris doctorate (J.D.- Law), pharm. d. (Pharmacy), master of divinity degree	Bachelor's degree	3	7		1			1						Signifies both completion of the academic requirements for beginning practice in a given profession and a level of professional skill beyond that normally required for a bachelor's degree	**D**	
US8	First professional degrees: doctor of medicine (M.D.), doctor of dentistry (D.D.S., D.M.D.), doctor of veterinary medicine	Bachelor's degree	4	8		1			1							**D**	

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University and non-university higher education degrees awarded in selected countries

US9	Doctor's degree (Ph.D.)	Master's degree	3 to 5	9 to 11		1				1		1			If a master's degree is not required, then duration of program is longer	E	

SOURCE: Organisation for Economic Co-operation and Development.

P/T = part-time
1 = Yes

R12 Categories
A=Non-university, tertiary
B=1st university short (<4)
C=1st university long (4+)
D=2nd university degree
E=Advanced research qualification
N=Not included

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Higher Education: An International Perspective

Appendix B: Detailed Tables

Tables 1.2-1.5: Chapter 1 tables

Tables 2.1-2.19: Chapter 2 tables

Tables 3.1-3.11: Chapter 3 tables

Table 4.1-4.11: Chapter 4 tables

Table 5.1-5.2: Chapter 5 tables

Table B1.2: Enrollment in U.S. institutions of higher education, by level of education: 1931 to 1995 (in thousands)

Year	Four-year higher education institutions	Two-year higher education institutions
1931-32	1,069	85
1950	2,064	217
1970	6,262	2,319
1990	8,529	5,181
1995	8,769	5,493

SOURCE: National Center for Education Statistics, *120 Years of American Education: A Statistical Portrait*, Table 24; 1995 Data: National Center for Education Statistics, *Digest of Education Statistics, 1997*, Table 206

Table B1.4: New entrants to German postsecondary institutions, by institution type: 1960 to 1991

Year	Universities	Fachhochschulen
1960	60.0	16.8
1965	61.3	21.9
1970	91.6	30.5
1975	119.9	43.8
1980	135.6	56.3
1985	141.3	63.4
1991	185.1	83.1

SOURCE: Der Bundesminister fur Bildung und Wissenschaft, *Grund-Und Structur Daten, 1992-93*, pp. 156-157.

Table B1.5: Enrollments in postsecondary institutions in Japan: 1950 to 1987

Year	Universities	Junior and technical colleges	Vocational/technical "special training" schools	"3rd sector" proprietary schools
1950	224,734	15,098	-	486,609
1955	513,181	77,885	-	958,292
1960	601,464	83,475	-	1,239,621
1965	895,465	153,115	-	1,383,712
1970	1,344,358	280,945	-	1,352,686
1975	1,652,003	372,964	-	1,205,318
1976	1,739,930	383,702	90,619	1,087,137
1977	1,786,112	392,949	268,990	870,103
1978	1,808,995	398,953	310,800	781,031
1979	1,793,930	392,471	312,379	770,959
1980	1,741,504	389,663	337,864	724,401
1981	1,725,814	390,993	356,479	659,967
1982	1,716,956	393,037	361,937	627,688
1983	1,729,632	398,323	385,911	605,944
1984	1,734,080	400,884	404,153	579,272
1985	1,734,392	390,410	398,821	530,159
1986	1,758,635	416,125	434,489	483,283
1987	1,806,027	457,674	483,243	466,063

SOURCE: Organisation for Economic Cooperation and Development, *Alternatives to Universities*, Table 16.

Table B2.1: Number of full-time students enrolled in public and private higher education institutions per 100 persons in the population aged 5 to 29, by year and country: 1975 to 1995

	Number per 100 persons		
Country	1975	1985	1995
Australia	4.5	m	6.4
Austria	2.9	6.5	8.6
Canada	6.7	8.6	11.2
Denmark	6.1	6.8	10.1
Finland	5.0	7.3	12.6
France	4.9	6.4	10.3
Germany	4.4	7.1	8.3
Greece	3.4	m	8.2
Ireland	2.4	3.3	6.4
Italy	4.6	5.5	9.6
Japan	4.3	m	8.7
Korea	m	6.0	9.4
Mexico	m	m	2.9
Netherlands	4.9	5.5	7.7
New Zealand	2.5	3.0	7.0
Norway	m	4.7	9.5
Spain	3.7	5.4	10.6
Sweden	5.6	6.5	6.4
Switzerland	m	4.0	5.2
Turkey	1.5	1.6	3.8
United Kingdom	2.5	2.9	5.8
United States	6.6	7.4	8.7

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997. Table C1.1

Table B2.2: Number of students in public and private higher education per 100 persons in the population aged 5 to 29, by country: 1995

Country	Enrollment per 100 persons
Australia	15
Austria	9
Belgium	11
Canada	17
Czech Republic	5
Denmark	10
Finland	13
France	10
Germany	9
Hungary	5
Iceland	7
Ireland	8
Italy	10
Japan	9
Korea	11
Luxembourg	m
Mexico	3
Netherlands	10
New Zealand	12
Norway	12
Poland	m
Portugal	8
Russian Federation	9
Spain	11
Sweden	9
Switzerland	7
Turkey	4
United Kingdom	9
United States	15

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997. Table C1.1a

Table B2.4, 6-7: Percent of population enrolled in public and private education institutions, education, and country: 1995

	Age 17			Age 18			Age 19		
Country	Secondary education	Non-university higher education	University	Secondary education	Non-university higher education	University	Secondary education	Non-university higher education	University
Australia	77	3	14	32	10	24	20	10	24
Austria	88	n	n	56	1	6	22	2	12
Belgium	99	n	1	54	14	19	31	23	21
Canada	69	4	6	34	11	17	10	17	25
Czech Republic	72	n	n	30	3	8	6	5	15
Denmark	82	n	n	71	n	n	52	n	3
Finland	90	n	n	80	1	n	28	4	10
France	91	m	m	60	m	m	34	m	m
Germany	93	1	n	82	2	1	57	3	6
Greece	56	n	n	14	12	22	6	10	29
Hungary	71	a	n	39	a	7	17	a	13
Iceland	77	n	n	65	n	n	63	n	1
Ireland	74	x	6	46	x	27	12	x	35
Italy	m	m	m	m	m	m	m	m	m
Japan	94	a	a	2	m	m	1	m	m
Korea	90	n	n	23	13	18	3	16	23
Luxembourg	78	m	m	70	m	m	54	m	m
Mexico	31	x	6	18	x	7	8	x	7
Netherlands	91	a	2	69	a	13	47	a	23
New Zealand	74	1	1	33	6	18	17	7	24
Norway	90	n	n	83	n	n	33	9	7
Poland	m	m	m	m	m	m	m	m	m
Portugal	71	n	1	45	2	8	27	4	13
Spain	75	n	n	43	n	19	26	1	26
Sweden	96	x	n	87	x	1	24	x	11
Switzerland	82	n	n	75	1	n	52	1	3
Turkey	23	1	2	10	2	5	6	3	8
United Kingdom	73	1	1	31	4	18	15	6	24
United States	75	1	2	22	14	19	4	17	21

a = Data not applicable.

m = Data not available.

n = Magnitude is either negligible or zero

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997*, Table C3.3.

by age and level of

Age 20		
Secondary education	Non-university higher education	University
17	8	21
8	2	16
20	27	19
m	17	26
3	3	14
31	1	10
18	7	18
15	m	m
31	4	11
4	9	23
11	a	14
33	1	10
7	x	31
m	m	m
m	m	m
n	13	23
33	m	m
5	x	8
32	a	28
13	6	26
19	12	12
m	m	m
21	6	16
20	1	28
12	x	19
23	3	7
n	3	9
10	5	24
2	11	23

Table B2.5: Net enrollment rates, by level of education, age, and country: 1994

	Universities							
	Age							
Country	17	18	19	20	21	22	23	24
Australia	12.6	23.0	23.3	20.3	16.1	11.4	8.6	7.2
Belgium	0.6	18.9	20.3	18.4	16.8	13.8	9.4	5.9
Canada	11.9	22.7	29.0	27.4	25.9	22.0	16.3	11.7
Finland	0.6	0.5	9.3	15.7	20.6	22.9	21.8	20.3
France	2.0	18.6	24.0	25.7	24.4	21.2	16.2	10.8
Germany	0.8	1.0	5.5	11.7	15.3	15.5	16.7	15.8
Ireland	3.9	16.8	22.0	19.7	14.9	9.0	5.3	3.6
New Zealand	1.5	19.9	26.4	26.5	22.3	15.6	10.5	7.6
Switzerland	0.0	0.5	2.9	7.1	9.7	10.1	9.3	8.1
Turkey	2.6	6.3	8.7	9.1	8.9	7.8	6.6	5.1
United Kingdom	1.3	16.7	21.8	21.0	15.7	9.2	6.0	4.5
United States	1.7	20.5	20.8	21.4	22.5	19.9	15.6	11.8
	Non-university institutions							
Australia	2.9	9.6	9.9	8.6	7.0	5.9	5.4	4.9
Belgium	0.2	12.2	20.6	23.4	18.8	12.1	7.1	4.3
Canada	4.1	9.3	15.4	17.7	14.0	11.2	7.2	8.7
Finland	0.5	1.7	4.0	7.0	9.3	9.4	8.4	6.2
France	0.2	4.5	10.5	13.1	10.9	6.3	2.9	1.3
Germany	0.8	1.8	2.6	2.9	2.4	1.8	1.7	1.7
Ireland	3.6	15.9	14.7	11.6	6.6	4.2	2.6	1.7
Switzerland	0.2	0.5	1.3	3.0	4.6	5.8	6.4	5.8
Turkey	1.0	2.1	2.6	2.3	2.0	1.6	1.2	1.0
United Kingdom	0.6	4.0	6.1	5.3	3.9	3.2	2.7	2.4
United States	1.2	14.4	17.5	12.1	10.4	7.7	6.5	6.8

SOURCE: Organization for Economic Co-operation and Development,
Indicators of Education Systems Project, *"Comparisons of Quantitative Indicators,"*
Table 4, December 11-13, 1996.

Table B2.9-10: Percent of population enrolled in public and private higher education, by age group and level of education: 1995

	Ages 18-21			Ages 22-25			Ages 26-29		
Country	Non-university	University	Total	Non-university	University	Total	Non-university	University	Total
Canada	14.5	23.4	37.9	7.3	14.4	21.7	3.9	5.3	9.2
Mexico	x	0.9	0.9	x	0.5	0.5	x	2.3	2.7
United States	12.8	21.9	34.7	6.6	14.1	20.7	3.9	6.6	10.5
Australia	8.7	21.1	29.8	5.4	8.7	14.1	4.0	4.9	8.9
Japan	m	m	m	m	m	m	m	m	m
Korea	12.6	21.5	34.1	3.6	12.8	16.3	0.5	2.9	3.4
New Zealand	5.9	22.7	28.6	3.3	10.0	13.3	2.5	4.8	7.2
Austria	1.6	12.6	14.2	0.9	14.1	15.0	x	8.5	8.5
Belgium	21.6	19.1	40.7	8.1	8.5	16.5	1.9	1.7	3.6
Denmark	1.0	7.9	8.9	2.3	20.3	22.6	1.1	10.0	11.2
Finland	5.2	12.3	17.5	5.6	21.8	27.4	1.8	11.2	12.9
France	x	x	34.2	x	x	17.7	x	x	4.6
Germany	2.7	7.9	10.6	1.7	15.3	17.0	1.9	9.5	11.4
Greece	9.7	23.2	32.9	3.8	6.8	10.6	1.0	2.2	3.2
Ireland	x	x	27.2	x	x	15.5	m	m	m
Italy	m	m	m	m	m	m	m	m	m
Luxembourg	m	m	m	m	m	m	m	m	m
Netherlands	a	23.2	23.2	a	18.7	18.7	a	5.6	5.6
Portugal	4.6	13.3	17.9	3.2	12.5	15.7	1.1	4.8	5.9
Spain	0.7	24.9	25.6	0.2	17.3	17.5	n	5.5	5.5
Sweden	x	13.0	13.0	x	16.6	16.6	x	7.5	7.5
United Kingdom	4.9	20.9	25.8	2.5	6.8	9.3	1.6	3.2	4.8
Czech Republic	3.4	12.5	15.9	0.5	7.5	8.0	n	2.1	2.1
Hungary	a	11.9	11.9	a	7.9	7.9	a	2.3	2.3
Iceland	0.9	7.0	7.9	3.3	17.0	20.3	1.4	5.5	6.9
Norway	8.0	9.5	17.5	5.6	17.9	23.6	2.3	7.7	10.0
Poland	m	m	m	m	m	m	m	m	m
Switzerland	2.4	5.2	7.7	5.9	8.8	14.7	3.4	3.9	7.2
Turkey	2.4	7.7	10.1	1.4	6.0	7.4	0.8	2.6	3.4

a = Data not applicable.
m = Data not available.
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators, 1997,* TableC5.2b.

Table B2.11: Expected years of higher education for all persons aged 17 and older, by level of education, sex and country: 1995

Country	Non-university higher education			University (undergraduate)			All higher education (undergraduate and graduate)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Australia	1.1	1.2	1.0	1.6	1.4	1.7	3.0	3.0	3.1
Austria	0.2	x	x	1.5	1.6	1.5	1.8	1.8	1.8
Belgium	1.3	1.1	1.4	1.1	1.2	1.0	2.5	2.1	2.6
Canada	1.6	1.6	1.5	1.9	1.7	2.2	3.7	3.5	3.9
Czech Republic	0.2	0.1	0.2	0.8	0.9	0.8	1.1	1.1	1.0
Denmark	0.2	0.2	0.2	1.0	0.8	1.2	2.1	2.0	2.2
Finland	0.6	0.4	0.8	2.1	2.0	2.1	2.8	2.6	3.1
France	x	x	x	x	x	x	2.5	2.2	2.8
Germany	0.3	0.2	0.3	1.6	1.8	1.4	1.8	1.9	1.7
Greece	0.6	0.6	0.6	1.3	1.3	1.3	1.9	1.9	1.9
Hungary	a	a	a	0.6	0.5	0.6	1.1	1.0	1.1
Iceland	0.3	0.2	0.3	1.3	1.2	1.5	1.6	1.4	1.8
Ireland	0.8	0.8	0.7	1.2	1.2	1.2	2.1	2.1	2.1
Italy	m	m	m	m	m	m	m	m	m
Japan	m	m	m	m	m	m	m	m	m
Korea	0.7	0.8	0.5	1.8	2.3	1.3	2.6	3.3	1.9
Luxembourg	m	m	m	m	m	m	m	m	m
Mexico	x	x	x	0.8	x	x	0.8	x	x
Netherlands	a	a	a	1.2	1.2	1.2	2.1	2.2	2.0
New Zealand	0.7	0.6	0.7	1.6	x	x	2.5	2.3	2.7
Norway	0.7	0.7	0.8	1.0	0.8	1.2	2.4	2.2	2.6
Poland	m	m	m	m	m	m	m	m	m
Portugal	0.4	0.4	0.4	1.3	1.1	1.5	1.8	1.5	2.0
Spain	n	n	n	2.2	2.0	2.3	2.3	2.2	2.5
Sweden	x	x	x	1.7	1.6	1.9	1.8	1.7	2.0
Switzerland	0.6	0.8	0.4	0.7	0.8	0.6	1.4	1.8	1.1
Turkey	0.3	0.3	0.2	0.7	0.9	0.5	1.0	1.2	0.8
United Kingdom	0.5	0.5	0.5	1.2	1.2	1.2	2.0	1.9	2.0
United States	1.2	1.1	1.4	1.7	1.5	1.8	3.3	3.0	3.6

a = Data not applicable.

m = Data not available.

n = Magnitude is either negligible or zero

x = Data included in another category.

NOTE: Number of years include full-time, plus part-time attendance.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table C5.1.

Table B2.12: Net entry rates for university-level education, by age group and country: 1995

	Net entry rates by age group			
Country	15-29	15-34	15-39	15 and over
Australia	m	m	m	m
Austria	25	26	26	26
Belgium	m	m	m	m
Canada	43	44	46	49
Czech Republic	m	m	m	m
Denmark	26	29	30	31
Finland	m	m	m	m
France	33	33	33	33
Germany	26	27	27	27
Greece	15	x	x	16
Hungary	19	x	x	20
Iceland	m	m	m	m
Ireland	27	27	x	27
Italy	m	m	m	m
Japan	m	m	m	m
Korea	m	m	m	m
Luxembourg	m	m	m	m
Mexico	m	m	m	m
Netherlands	32	32	33	34
New Zealand	33	35	37	40
Norway	20	21	23	25
Poland	m	m	m	m
Portugal	m	m	m	m
Spain	m	m	m	m
Sweden	m	m	m	m
Switzerland	15	15	15	15
Turkey	15	16	16	16
United Kingdom	37	39	40	43
United States	47	x	x	52

m = Data not available.

x = Data included in another category.

NOTE: "Net entry rate" equals the proportion of the population in the age group that enters, but does not necessarily finish, university.
SOURCE: Organization for Economic Co-operation and Development.

Table B2.13-15: Percent of 17 to 34 year-olds enrolled in public and private higher education by level of education, sex, and country: 1995

	Non-University higher education			University			Total		
Country	Total	Male	Female	Total	Male	Female	Total	Male	Female
Australia	5.0	5.5	4.6	9.4	8.6	10.1	14.4	14.2	14.7
Austria	0.5	x	x	8.6	9.0	8.1	9.0	x	x
Belgium	7.1	6.2	13.2	6.4	6.6	13.1	7.7	5.7	13.4
Canada	6.3	6.8	5.9	9.9	9.0	10.9	16.3	15.8	16.8
Czech Republic	1.0	0.7	1.4	5.5	6.0	5.1	6.6	6.7	6.4
Denmark	1.1	1.2	1.0	9.6	9.0	10.3	10.8	10.3	11.3
Finland	2.9	2.1	3.8	11.1	11.1	11.2	14.0	13.2	14.9
France	x	x	x	x	x	x	13.6	12.2	15.1
Germany	1.3	1.0	1.6	8.0	9.2	6.8	9.3	10.2	8.4
Greece	3.2	3.2	3.3	7.3	7.3	7.3	10.5	10.5	10.6
Iceland	1.4	1.3	1.6	7.0	6.3	7.8	8.5	7.5	9.4
Ireland	m	m	m	m	m	m	m	m	m
Italy	m	m	m	m	m	m	m	m	m
Korea	3.7	4.5	2.9	8.7	11.5	5.7	12.4	16.0	8.6
Luxembourg	m	m	m	m	m	m	m	m	m
Mexico	x	x	x	4.6	x	x	4.6	x	x
Netherlands	a	a	a	10.7	11.2	10.3	10.7	11.2	10.3
New Zealand	3.2	3.0	3.4	9.3	8.7	9.8	12.5	11.7	13.2
Norway	3.8	3.5	4.2	8.9	8.3	9.6	12.8	11.8	13.7
Poland	m	m	m	m	m	m	m	m	m
Portugal	2.2	2.0	2.4	7.7	6.5	8.9	9.9	8.5	11.3
Spain	0.2	0.2	0.2	11.5	10.6	12.5	11.7	10.8	12.7
Sweden	x	x	x	9.2	8.7	9.8	9.2	8.7	9.8
Switzerland	3.3	4.5	2.1	4.6	5.4	3.8	7.9	9.9	5.9
Turkey	1.3	1.4	1.2	4.2	5.3	3.2	5.6	6.7	4.4
United Kingdom	2.3	2.2	2.4	7.0	7.1	6.9	9.3	9.2	9.3
United States	5.9	5.2	6.5	10.1	9.6	10.6	16.0	14.8	17.2

a = Data not applicable.
m = Data not available.
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table C5.2a.

Table B2.16: Number of foreign students enrolled in higher education as a percentage of stu

Countries of Origin	Austria	Belgium	Canada	Czech Republic	Denmark	Finland	France	Germany	Hungary	Iceland
Australia	0.01	n	0.02	n	0.02	0.01	n	0.01	n	0.01
Austria	a	0.01	n	n	0.02	0.01	0.02	0.31	0.01	0.03
Belgium	0.02	a	0.01	n	0.01	0.01	0.08	0.05	n	n
Canada	0.02	0.03	a	n	0.03	0.02	0.05	0.02	0.02	0.04
Czech Republic	0.04	0.01	n	a	n	n	n	0.04	0.03	n
Denmark	0.03	0.02	n	n	a	0.02	0.02	0.03	n	0.45
Finland	0.05	0.01	0.01	n	0.03	a	0.01	0.05	0.01	0.07
France	0.12	1.46	0.14	n	0.05	0.02	a	0.27	0.01	0.03
Germany	2.22	0.19	0.04	0.02	0.32	0.11	0.26	a	0.30	0.20
Greece	0.16	0.26	0.01	0.24	0.01	0.01	0.14	0.38	0.57	n
Hungary	0.24	0.02	n	0.02	0.01	0.04	0.02	0.07	a	n
Iceland	n	n	n	n	0.24	0.02	n	0.01	n	a
Ireland	0.02	0.02	0.01	n	0.02	0.01	0.03	0.03	n	n
Italy	2.46	1.25	0.01	n	0.03	0.03	0.16	0.27	n	0.03
Japan	0.12	0.02	0.25	n	0.01	0.03	0.06	0.07	0.01	n
Korea	0.16	0.01	0.08	n	n	n	0.08	0.22	n	n
Luxembourg	0.13	0.46	n	n	n	n	0.05	0.06	0.01	n
Mexico	0.02	0.01	0.04	n	0.01	n	0.03	0.01	n	0.04
Netherlands	0.04	0.84	0.01	n	0.05	0.01	0.04	0.12	0.01	n
New Zealand	n	n	0.01	n	0.01	n	n	n	n	n
Norway	0.03	0.01	0.01	n	0.44	0.02	0.02	0.06	0.06	0.19
Poland	0.23	0.04	0.01	0.05	0.08	0.04	0.06	0.22	0.05	0.04
Portugal	0.02	0.14	0.01	n	0.01	n	0.17	0.06	n	n
Russian Federation	0.07	0.02	n	0.03	0.01	0.12	0.04	0.13	0.08	0.01
Spain	0.08	0.44	0.01	n	0.04	0.01	0.16	0.20	n	0.09
Sweden	0.08	0.02	0.01	0.01	0.17	0.18	0.03	0.05	0.06	0.18
Switzerland	0.1	0.03	0.01	n	0.03	0.01	0.03	0.08	0.01	0.03
Turkey	0.54	0.25	0.01	n	0.1	0.02	0.08	1.06	0.03	n
United Kingdom	0.11	0.09	0.11	0.03	0.19	0.05	0.20	0.16	0.01	0.08
United States	0.21	0.06	0.21	0.01	0.14	0.09	0.14	0.21	0.11	0.26

a = Data not applicable.
n = Magnitude is either negligible or zero.
x = Data included in another category.

dents in the country of destination: 1995

Countries of destination

Ireland	Italy	Japan	Korea	New Zealand	Norway	Portugal	Spain	Switzerland	Turkey	United Kingdom	United States
0.02	0.01	0.01	n	0.19	0.02	0.01	n	0.03	n	0.04	0.02
0.01	0.01	n	n	n	0.02	n	0.03	0.34	n	0.03	0.01
0.03	0.01	n	n	n	0.01	0.01	0.04	0.16	n	0.08	0.01
0.05	0.01	n	n	0.02	0.05	0.06	n	0.10	n	0.09	0.16
n	n	n	n	n	n	n	n	0.04	n	0.01	n
0.03	n	n	n	0.01	0.38	n	0.01	0.05	n	0.06	0.01
0.01	n	n	n	n	0.10	n	0.01	0.05	n	0.03	0.01
0.24	0.03	n	n	0.01	0.08	0.13	0.19	1.11	n	0.49	0.04
0.37	0.07	0.01	nn	0.07	0.25	0.07	0.16	3.08	0.01	0.52	0.06
0.03	0.39	n	n	n	0.02	n	0.01	0.16	0.09	0.57	0.03
0.01	n	n	n	n	0.01	n	n	0.08	n	0.01	0.01
n	n	n	n	n	0.1	n	n	n	n	0.01	n
a	n	n	n	n	0.01	n	0.02	0.03	x	0.54	0.01
0.07	a	n	n	n	0.02	0.02	0.12	1.49	n	0.17	0.02
0.04	0.01	a	0.02	0.14	0.02	n	n	0.06	n	0.15	0.32
n	0.02	0.45	a	0.05	0.30	n	0.01	0.02	n	0.04	0.24
0.01	n	n	n	n	n	n	n	0.14	n	0.02	n
n	n	n	n	0.01	0.01	n	0.03	0.04	n	0.03	0.06
0.04	0.01	n	n	0.01	0.08	0.01	0.05	0.16	0.01	0.11	0.01
n	n	n	n	a	0.01	n	n	n	n	0.01	0.01
0.01	n	n	n	n	a	n	0.01	0.08	n	0.12	0.01
n	0.01	n	n	n	0.13	n	n	0.16	n	0.02	0.01
0.01	n	n	n	n	0.02	a	0.04	0.11	n	0.06	0.01
0.01	n	n	n	n	0.02	n	n	0.13	0.03	0.02	0.03
0.15	0.01	n	n	n	0.03	0.07	a	0.60	n	0.27	0.04
0.04	0.01	n	n	0.01	0.46	n	0.01	0.11	n	0.05	0.02
0.01	0.08	n	n	n	0.03	n	0.03	a	n	0.04	0.01
n	n	n	n	n	0.07	n	n	0.17	a	0.07	0.05
1.68	0.02	0.01	n	0.07	0.28	0.02	0.13	0.19	0.01	a	0.05
0.67	0.03	0.03	0.01	0.11	0.36	0.07	0.03	0.25	n	0.34	a

Table B2.17: Number of foreign students in OECD-Countries (absolute numbers): 1995

Countries of Origin	Austria	Australia	Belgium	Canada	Czech Republic	Denmark	Finland	France	Germany	Hungary
Australia	34	x	8	290	2	27	9	86	209	2
Austria	a	x	30	51	3	29	13	392	6686	20
Belgium	58	x	a	106	2	11	7	1577	1002	6
Canada	58	x	98	a	8	59	28	1035	463	40
Czech Republic	102	x	18	26	a	n	3	x	835	46
Denmark	71	x	54	83	1	a	28	389	710	2
Finland	126	x	32	102	2	58	a	275	1126	17
France	291	x	5137	x	x	80	28	a	5872	12
Germany	5195	x	655	722	42	544	135	5332	a	503
Greece	369	x	928	198	430	20	12	2806	8231	967
Hungary	570	x	71	82	33	25	53	334	1485	a
Iceland	11	x	7	52	n	400	21	66	283	5
Ireland	47	x	67	99	2	27	8	547	541	2
Italy	5767	x	4421	148	2	54	32	3372	5890	5
Japan	271	x	55	4530	n	22	41	1219	1599	16
Korea	380	x	36	1360	2	m	n	1601	4799	n
Luxembourg	298	x	1605	3	n	1	1	1048	1193	13
Mexico	55	x	36	783	2	12	4	605	277	n
Netherlands	91	x	2949	153	1	80	16	841	2564	14
New Zealand	3	x	2	120	n	10	2	19	53	n
Norway	77	x	33	104	5	745	28	392	1274	101
Poland	531	x	153	133	98	134	46	1331	4659	89
Portugal	36	x	504	156	4	17	6	3492	1330	n
Russian Federation	164	x	65	n	57	12	157	891	2727	138
Spain	184	x	1542	142	3	61	13	3263	4241	5
Sweden	178	x	69	232	9	289	229	708	1079	103
Switzerland	230	x	119	225	1	44	13	611	1756	15
Turkey	1255	x	870	151	1	166	21	1734	22747	49
United Kingdom	248	x	321	1938	45	324	58	4127	3535	11
United States	486	x	213	3742	13	230	117	2945	4512	193

a = Data not applicable.
m = Data not available.
n = Magnitude is either negligible or zero.
x = Data included in another category.

Countries of destination

Iceland	Ireland	Italy	Japan	Korea	New Zealand	Norway	Portugal	Spain	Switzerland	Turkey	United Kingdom
1	22	115	248	21	317	32	18	33	39	19	674
2	16	93	31	2	n	35	5	402	501	9	497
n	42	185	22	2	2	25	26	632	239	n	1505
3	57	252	131	47	35	90	171	54	150	11	1713
n	n	1	16	n	n	4	1	n	66	18	94
33	32	45	27	n	10	663	2	195	70	n	1003
5	18	63	25	1	4	175	4	108	70	10	630
2	297	575	131	5	10	130	537	2895	1649	3	8936
15	445	1282	270	51	116	436	204	2458	4560	145	9518
n	38	7046	14	2	2	27	3	177	239	1056	10374
n	8	76	33	n	n	25	4	23	123	5	229
a	1	23	6	n	n	175	n	7	6	7	120
n	a	18	15	n	1	15	3	263	44	x	9799
2	81	a	57	n	1	41	60	1767	2211	20	3107
n	45	146	a	350	234	37	1	54	92	7	2673
n	3	323	17788	a	84	512	n	80	31	n	784
n	10	37	1	n	n	1	11	17	203	2	273
3	3	n	98	4	14	15	1	509	53	n	598
n	43	106	39	n	18	138	21	698	243	74	2009
n	5	4	70	n	a	10	n	2	5	n	238
14	13	53	12	n	7	a	4	104	120	1	2094
3	5	232	43	n	1	220	3	48	235	3	409
n	9	33	20	2	3	26	a	545	163	n	1090
1	9	n	122	9	n	26	n	n	196	408	302
7	187	189	44	2	n	54	203	a	890	3	4983
13	53	104	30	6	11	803	8	216	166	6	943
2	18	1479	21	1	7	53	11	454	a	2	686
n	3	n	37	7	1	113	n	4	247	a	1183
6	2034	392	218	2	111	479	59	1948	287	142	a
19	809	480	1164	328	183	616	206	384	376	17	6243

United States	Total
2247	4453
887	9704
900	6349
22747	27250
654	1884
1022	4440
924	3775
5843	32433
8592	41220
3699	36638
885	4064
568	1758
909	12407
2704	29742
45276	56668
33599	61382
65	4782
9003	12075
1847	11945
798	1341
2123	7304
1593	9969
739	8175
4832	10116
5126	21142
3432	8687
1630	7378
6716	35305
7786	24161
a	23276

Table B2.18-19: Number of public and private higher education institutions, number of stud and average number of students per institution, by level and country: various years

		Number of institutions			Students enrolled (in thousands)		
Country	Year	Non-university	University	Total	Non-university	University	Total
Australia	1991-93	290	45	335	1,043	575	1,618
Belgium	1990-91						
Canada	1994-95	216	77	293	542	866	1,408
Czech Republic	1995	-	110	110	-	150	150
Finland	1995	-	22	22	-	126	126
France	1996	1947	78	2025	236	1486	1722
Germany	1995	46	280	326	30	1,828	1,858
Italy	1993-94		87			1,628	
Korea	1990	151	405	556	364	1127	1491
Japan	1994	658	565	1,223	555	2,547	3,102
Netherlands	1992-93	70	13	83	261	162	423
New Zealand	1987-88	68	39	107	154	208	362
Russia	1995-96	685	74	759	2,263.50	514.5	2,778
Taiwan	1987-88	68	39	107	154	208	362
Spain	1995-96	-	54	54	-	1,608	1,608
Sweden	1993-94	37	29	66			270
Switzerland	1992?	23	10	33			
United Kingdom	1993	146	88	234	368	1,339	1,707
United States	1994	1,603	1,942	3,545	5,493	8,769	14,262

SOURCES:
CANADA-- Education in Canada, 1996. There are no FTE; enrollment includes both PT and FT students.
CZECH REPUBLIC-- Education in Transition 1990-1995, numbers do not include post-maturita studies, no other non-university app
FINLAND-- EURYDICE, 1995, there are 10 traditional universities and 12 special schools (like Georgia Tech, etc.)
FRANCE--counted up schools from list on net Others from http://www.education.gouv.fr/syst/orgs45b.htm (did not include pre
GERMANY-- Grund- und Strukturdaten 1996/97, non-university only includes kunsthochschulen.
ITALY-- statistiche dell'istruzione universitaria, 1995 (Diplome and Laurea)
JAPAN--Monbusho 1996; ISCED 6=universities; ISCED 5=junior colleges and colleges of technology (specialized training and mis
KOREA-- Education in Korea, 1990. Universities = college and universities and graduate school. All others are non-university.
NETHERLANDS-- EURYDICE/CEDEFOP, excluded distance learning, says data is from Facts and Figures 1993
RUSSIA-- Higher Education in Russia, p 17.
SPAIN--del Advance de datos estadisticos del surso 1996-97. (only have data for universities-- very few non-universities)
SWEDEN-- Review of National Policies for Education, p 53., Strategies foe education research, 1995, p 21
SWITZERLAND-- Handbook, p. 752
TAIWAN-- EURYDICE, 1995
UNITED KINGDOM-- Only universities were counted as ISCED 6. Though we are aware that some higher education colleges are
UNITED STATES-- Digest of Education Statistics, p 219.

ents enrolled,

Average number of students per institution		
Non-university	University	Total
3,597	12,778	4,830
2,509	11,247	4,805
-	1,364	1,364
-	5,727	5,727
121	19,051	70
650	6,530	5,699
	18,713	
2411	2783	2682
843	4,508	2,536
3,729	12.462	5,096
2.265	5.333	3.383
3.304	6.953	3.660
2.265	5.333	3.383
-	29,778	29.778
		4,091
2.521	15.216	7.295
338	4,516	4.023

arently

p-primary).

cellaneous schools will be footnoted.)

ISCED 6, we could not differentiate between them. The numbers represent both FT, sandwich (internships), and PT students

Table B3.1: Expenditure per student on public and private higher education institutions, by level of education and country: 1994

Country	All	Non-university	University
Australia	$9,710	$6,320	$11,030
Austria*	8,720	12,040	8,530
Belgium**	6,390	x	x
Canada	11,300	10,720	11,680
Czech Republic*	5,320	2,630	5,660
Denmark	8,500	x	x
Finland	6,080	x	x
France	6,010	x	x
Germany*	8,380	4,960	8,560
Greece**	2,680	1,870	3,030
Hungary*	5,100	a	5,100
Iceland	m	m	m
Ireland	7,600	x	x
Italy*	4,850	5,350	4,820
Japan	8,880	5,760	9,600
Korea	4,560	2,830	5,240
Luxembourg	m	m	m
Mexico	5,750	x	5,750
Netherlands	8,540	a	8,540
New Zealand	8,020	8,200	7,970
Norway*	x	x	x
Poland	m	m	m
Portugal*	m	m	m
Spain	4,030	x	x
Sweden	12,820	x	x
Switzerland*	15,850	8,850	18,020
Turkey*	3,460	x	x
United Kingdom**	7,600	x	x
United States	15,510	x	x

* Public institutions

** Public and government-dependent private institutions

a = Data not applicable.

m = Data not available.

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997. Table B4.1

Table B3.2: Distribution of public and private sources of inital funds for institutions in higher education, by source and country: 1994

Country	Public	Private
Australia	75	25
Austria	m	m
Belgium	m	m
Canada	91	9
Czech Republic	m	m
Denmark	100	n
Finland	m	m
France	83	17
Germany	90	10
Greece	m	m
Hungary	m	m
Iceland	m	m
Ireland	79	21
Italy	89	11
Japan	46	54
Korea	16	84
Luxembourg	m	m
Mexico	m	m
Netherlands	98	2
New Zealand	m	m
Norway	m	m
Poland	m	m
Portugal	100	n
Spain	78	22
Sweden	93	7
Switzerland	m	m
Turkey	94	6
United Kingdom	100	n
United States	48	52

n = Magnitude is either negligible or zero.
m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B2.3.

Table B3.3: Educational expenditure, as a percentage of GDP for higher education, by source of funds and country: 1994

Country	Total expenditure from public, private, and international sources on educational institutions plus public subsidies to households	Total expenditures from both public and private sources on educational institutions	Direct public expenditure on educational institutions	Private payments to educational institutions excluding public subsidies to households and other private entities	Total public subsidies to households and other private entities excluding public subsidies for student living costs	Private payments other than to educational institutions	Financial aid for students to educational institutions not attributable to household payments for educational subsidies
Australia	2.0	1.8	1.2	0.45	0.16	m	0.19
Austria	1.0	1.0	0.9	0.01	0.06	m	a
Belgium	m	m	1.0	m	n	m	0.19
Canada	2.6	2.5	1.6	0.23	0.67	0.42	0.06
Czech Republic	m	m	0.8	m	n	m	0.09
Denmark	2.1	1.4	1.4	0.01	n	m	0.71
Finland	1.9	1.5	1.5	x	m	0.40	0.40
France	1.2	1.1	0.9	0.18	n	0.09	0.09
Germany	1.1	1.1	0.9	0.10	0.01	m	0.09
Greece	0.7	0.7	0.7	m	n	m	0.01
Hungary	1.3	1.1	0.9	0.19	n	m	0.15
Iceland	1	0.7	0.7	0.05	m	m	0.32
Ireland	1.6	1.4	1.0	0.29	0.12	m	0.16
Italy	0.9	0.8	0.7	0.09	0.02	0.06	0.05
Japan	1.1	1.1	0.5	0.59	m	m	m
Korea	1.8	1.8	0.3	1.48	n	m	0.01
Luxembourg	m	m	m	m	m	m	m
Mexico	1.1	1.1	0.9	0.21	x	0.02	m
Netherlands	1.7	1.3	1.2	0.03	0.13	0.36	0.33
New Zealand	m	m	1.1	m	0.29	m	0.29
Norway	m	m	1.4	m	n	0.75	0.75
Poland	m	m	m	m	m	m	m
Portugal	0.9	0.8	0.8	a	a	0.08	0.08
Spain	1.1	1.0	0.8	0.23	n	0.11	0.06
Sweden	2.2	1.6	1.5	0.11	a	0.68	0.54
Switzerland	m	m	1.1	m	0.01	m	0.05

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Turkey	1.3	1.3	1.2	0.08	0.05	0.66	0.01
United Kingdom	1.2	0.9	0.7	n	0.27	0.26	0.27
United States	2.4	2.4	1.1	1.24	0.02	0.12	0.02

n = Magnitude is either negligible or zero

x = Data included in another category.

a = Data not applicable.

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B1.1c.

Table B3.4: Percentage of the total population, by age group: 1995

Country	Age 15-24	Age 25-29
Australia	15.3	7.6
Austria	12.8	8.8
Belgium	12.8	7.5
Canada	13.7	7.9
Czech Republic	16.5	6.6
Denmark	13.5	7.8
Finland	12.4	7
France	13.9	7.4
Germany	11.4	8.5
Greece	14.9	7.6
Hungary	15.8	6.6
Iceland	15.6	7.8
Ireland	17.4	6.9
Italy	14.2	8.2
Japan	15.1	6.9
Korea	19.0	9.3
Luxembourg	11.8	8.2
Mexico	21.4	8.8
Netherlands	13.4	8.4
New Zealand	15.2	7.6
Norway	13.7	7.9
Poland	15.5	6.3
Portugal	16.5	7.6
Russian Federation	13.9	6.5
Spain	16.6	8.2
Sweden	12.4	7.2
Switzerland	12.2	8.1
Turkey	20.3	8.4
United Kingdom	13.3	8.3
United States	13.8	7.3

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table A1.1

Table B3.5: Educational expenditure from public and private sources on higher education institutions as a percentage of GDP, by level of education and country: 1995

Country	All	Non-university	University
Australia	1.8	0.3	1.5
Austria	1.0	0.1	0.9
Belgium	m	m	m
Canada	2.5	0.9	1.6
Czech Republic	m	m	m
Denmark	1.4	x	x
Finland	1.5	0.2	1.2
France	1.1	x	x
Germany	1.1	n	1.0
Greece	0.7	0.1	0.5
Hungary	1.1	n	1.1
Iceland	0.7	x	m
Ireland	1.4	x	x
Italy	0.8	0.1	0.8
Japan	1.1	0.1	1.0
Korea	1.8	0.3	1.5
Luxembourg	m	m	m
Mexico	1.1	x	1.1
Netherlands	1.3	a	1.3
New Zealand	m	m	m
Norway	m	m	m
Poland	m	m	m
Portugal	m	m	0.8
Spain	1.0	x	x
Sweden	1.6	x	x
Switzerland	m	m	m
Turkey	1.3	x	x
United Kingdom	0.9	x	x
United States	2.4	x	x

a = Data not applicable.

m = Data not available.

n = Magnitude is either negligible or zero

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997. Table B1.1d

Table B3.6: Average annual public subsidies to households for education as a percentage of GDP and per student enrolled (U.S. dollars converted using PPPs), by subsidy category and country(1994-1995)

	Scholarships/ grants and loan-related subsidies		of which loan-related subsides (%)	Scholarship/ grants net of fees and loan related subsidies		Allowances contingent on student status		Tax reduction		Specific subsidies	
Country	as % GDP	per student enrolled		as % GDP	per student enrolled	as % GDP	per student enrolled	as % GDP	per student enrolled	as % GDP	per student enrolled
Australia	0.35	$1,903	45.6	0.19	$1,035	a	a	0.07	$210	m	m
Austria	0.06	445	a	0.06	445	0.12	$836	m	m	0.01	$95
Belgium	0.02	140	a	0.02	140	m	m	m	m	m	m
Canada	0.38	1,693	3.1	0.36	1,641	a	a	m	m	m	m
Czech Republic	0.01	86	a	0.01	86	0.09	493	0.03	168	0.10	584
Denmark	0.45	2,810	23.0	0.35	2,162	a	a	a	a	a	a
Finland	0.39	1,595	14.2	0.33	1,370	a	a	m	m	0.07	290
France	0.08	462	0.3	0.08	457	m	m	0.12	686	0.15	831
Germany	0.08	668	44.2	0.05	373	0.05	160	0.07	249	0.01	115
Greece	0.01	44	4.7	0.01	42	a	a	a	a	m	m
Ireland	0.28	1,502	a	0.13	712	x	x	m	m	m	m
Mexico	0.03	155	74.1	0.01	40	a	a	a	a	a	a
Netherlands	0.51	2,469	12.7	0.22	1,374	m	m	m	m	0.07	470
New Zealand	0.65	3,019	61.1	0.25	1,175	a	a	m	m	m	m
Norway	0.86	4,578	70.1	0.22	1,233	m	m	m	m	0.03	155
Spain	0.11	325	a	0.06	241	a	a	a	a	a	a
Sweden	0.64	4,995	66.7	0.21	1,663	a	a	a	a	0.17	1,322
Switzerland	0.05	579	7.8	0.04	534	m	m	m	m	m	m
United Kingdom	0.49	3,981	16.8	0.21	1,714	m	m	a	a	m	m
United States	0.04	238	m	0.04	238	a	a	a	a	m	m

a = Data not applicable.
m = Data not available.
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B3.1b.

Table B3.7: Initial sources of public educational funds and final purchasers of educational resources for higher education, by level of government and country: 1994

	Initial funds (before transfers between) levels of government)				Final Funds (after transfers between levels of government)			
Country	Central	Regional	Local	Total	Central	Regional	Local	Total
Australia	90	10	n	100	86	14	n	100
Austria	m	m	m	m	m	m	m	m
Belgium	16	83	1	100	16	83	2	100
Canada	47	53	n	100	33	67	n	100
Czech Republic	99	a	1	100	99	a	1	100
Denmark	89	1	10	100	89	1	10	100
Finland	89	a	11	100	85	a	15	100
France	92	5	3	100	92	5	3	100
Germany	15	84	1	100	7	93	1	100
Greece	100	n	a	100	100	n	n	100
Hungary	100	n	n	100	100	n	n	100
Iceland	100	n	n	100	100	n	n	100
Ireland	100	a	n	100	77	a	23	100
Italy	87	11	2	100	87	11	2	100
Japan	91	x	x	100	90	x	x	100
Korea	100	a	a	100	100	a	a	100
Luxembourg	m	m	m	m	m	m	m	m
Mexico	90	10	n	100	87	13	n	100
Netherlands	100	n	n	100	98	n	2	100
New Zealand	100	a	a	100	100	a	a	100
Norway	100	a	a	100	100	a	a	100
Poland	m	m	m	m	m	m	m	m
Portugal	m	m	m	m	m	m	m	m
Spain	49	50	1	100	49	50	1	100
Sweden	97	3	a	100	97	3	a	100
Switzerland	45	54	n	100	30	69	1	100
Turkey	100	a	a	100	100	a	a	100
United Kingdom	100	a	n	100	65	a	35	100
United States	34	66	x	100	25	75	x	100

a = Data not applicable.
m = Data not available.
n = Magnitude is either negligible or zero
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997. Table B6.1b

Table B3.8: Educational expenditure on higher education for public and private institutions, by resource category and country: 1994

	Percentage of total expenditure		Percentage of current expenditure				Average compensation per student (in equivalent U.S. dollars)			
Country	Current	Capital	Compensation of teachers	Compensation of other staff	Compensation of all staff	Other current expenditures	Teachers	All Staff	Current	Capital
Australia	92	8	x	x	67	33	x	$5,979	$8,899	$815
Austria	84	16	30	22	51	49	m	m	m	m
Belgium	97	3	73	2	74	26	$4,515	4,609	6,205	185
Canada	93	7	43	35	79	21	x	8,270	10,524	773
Czech Republic	82	18	32	28	60	40	1,407	2,611	4,342	975
Denmark	87	13	52	25	77	23	3,826	5,684	7,374	1,126
Finland	95	5	39	27	66	34	2,239	3,790	5,758	325
France	90	10	x	x	68	32	x	3,693	5,421	587
Germany	89	11	x	x	75	25	x	5,622	7,460	925
Greece	74	26	65	n	65	35	1,286	1,286	1,974	710
Hungary	90	10	x	x	72	28	x	3,268	4,569	528
Iceland	95	5	x	x	82	18	m	m	m	m
Ireland	92	8	60	25	85	15	4,262	6,035	7,137	631
Italy	86	14	45	25	70	30	1,875	2,918	4,196	655
Japan	78	22	x	x	60	40	x	4,175	6,939	1,940
Korea	80	20	x	x	68	32	x	2,634	3,894	949
Luxembourg	m	m	m	m	m	m	m	m	m	m
Mexico	91	9	m	m	m	m	x	5,285	5,443	520
Netherlands	93	7	x	x	73	27	x	5,814	7,966	569
New Zealand	m	m	m	m	m	m	m	m	m	m
Norway	88	12	x	x	63	37	x	4,347	6,946	930
Poland	m	m	m	m	m	m	m	m	m	m
Portugal	82	18	x	x	84	16	m	m	m	m
Spain	81	19	x	x	80	20	x	2,598	3,267	758
Sweden	100	x	x	x	58	42	x	7,434	12,818	m
Switzerland	86	14	51	28	79	21	7,023	10,808	13,694	2,160
Turkey	79	21	50	24	74	26	1,500	2,233	3,003	813
United Kingdom	93	7	30	15	45	55	2,120	3,182	7,100	500
United States	85	8	44	21	66	34	5,847	8,684	13,221	1,170

m = Data not available.

n = Magnitude is either negligible or zero.

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B5.1b.

Table B3.9: Ratio of students to teaching staff in higher of education (calculations based on full-time equivalents), by control, level of education, and country: 1995

	Public education			Public and private education		
Country	All higher education	Non-university	University	All higher education	Non-university	University
Australia	x	x	5.7	x	x	5.7
Austria	m	m	14.5	13.3	m	14.5
Belgium	m	x	12.4	m	x	14.1
Canada	16.0	14.5	17.3	11.3	7.6	17.5
Czech Republic	10.0	5.7	10.9	10.7	9.9	10.9
Denmark	19.7	m	m	19.7	m	m
Finland	x	m	m	x	m	m
France	19.0	x	19.0	16.9	x	x
Germany	m	m	m	m	m	m
Greece	m	m	m	m	m	m
Hungary	8.0	a	8.0	7.9	a	7.9
Iceland	7.7	11.5	7.7	m	m	m
Ireland	12.2	9.9	13.5	12.2	12.1	12.3
Italy	23.6	6.2	29.1	23.4	6.3	28.5
Japan	7.4	4.1	8.5	13.1	11.4	14.2
Korea	20.3	m	m	18.3	m	m
Luxembourg	m	m	m	m	m	m
Mexico	9.6	x	9.6	9.3	x	9.3
Netherlands	m	m	m	m	m	m
New Zealand	m	m	m	m	m	m
Norway	m	m	10.1	m	m	m
Poland	m	m	m	m	m	m
Portugal	m	m	m	m	m	m
Spain	21.1	14.1	21.3	21.4	14.7	21.5
Sweden	m	m	m	m	m	m
Switzerland	m	m	21.5	m	m	21.5
Turkey	27.0	109.5	21.5	26.6	m	21.2
United Kingdom	a	a	a	17.4	x	x
United States	16.2	20.4	14.4	15.5	19.4	14.2

a = Data not applicable.
m = Data not available.
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B8.1.

Table B3.10: Staff employed in public and private higher education as a percentage of the total employed population: 1995

Country	Higher education teaching staff, as a percent of employment
Australia	m
Austria	0.7
Belgium (Flemish)	0.7
Canada	1.3
Czech Republic	m
Denmark	0.4
Finland	x
France	0.6
Germany	0.8
Greece	0.4
Hungary	0.5
Iceland	m
Ireland	0.7
Italy	0.4
Japan	0.6
Korea	0.5
Luxembourg	m
Mexico	0.5
Netherlands	m
New Zealand	0.6
Norway	m
Poland	m
Portugal	m
Russian Federation	m
Spain	0.7
Sweden	0.7
Switzerland	m
Turkey	0.2
United Kingdom	0.3
United States	0.7

m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B7.1.

Table B3.11: Percentage of females among teaching staff in higher education, by employment status and country: 1995

Country	Full-time	Part-time
Australia	m	m
Austria	23.0	27.1
Belgium (Flemish)	31.0	38.0
Canada	31.4	35.4
Czech Republic	m	m
Denmark	30.0	30.8
Finland	m	m
France	30.6	30.8
Germany	22.0	34.5
Greece	32.6	m
Iceland	m	m
Ireland	25.2	37.1
Italy	31.6	a
Japan	18.5	24.4
Korea	27.0	14.8
Luxembourg	m	m
Mexico	m	a
Netherlands	m	m
New Zealand	34.6	52.0
Norway	m	m
Poland	m	m
Portugal	m	m
Spain	31.7	31.8
Sweden	m	m
Switzerland	m	m
Turkey	32.8	a
United Kingdom	25.2	47.5
United States	33.4	46.6

a = Data not applicable.
m = Data not available.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table B7.2.

Table B4.1: Ratio of higher education graduates to the population at the of graduation reference age (times 100), by type of program, sex, and country: 1995 (Figures 4.1-4.8)

Country	Non-University higher education programs			Short first university degree programs (e.g. U.S. bachelor's)			Long first university degree programs (e.g. German *diplom* or Italian *laurea*)			Second university degree programs (e.g. U.S. master's)			Ph.D. or equivalent		
	M + F	Male	Female	M + F	Male	Female	M + F	Male	Female	M + F	Male	Female	M + F	Male	Female
Australia	m	m	m	34.0	26.9	41.4	x	x	x	12.1	11.2	13.0	0.8	1.1	0.5
Austria	5.0	2.7	7.4	x	x	x	9.6	10.4	8.8	a	a	a	1.2	1.7	0.7
Belgium	28.0	23.0	32.0	a	a	a	26.0	27.0	25.0	5.2	4.9	5.5	0.7	0.9	0.4
Canada	m	m	m	31.0	25.8	36.3	x	x	x	4.9	5.0	4.8	0.8	1.1	0.5
Czech Republic	5.6	3.5	7.8	2.3	2.1	2.6	10.7	10.2	11.1	x	x	x	0.2	0.3	0.1
Denmark	8.1	9.9	6.2	20.6	16.7	24.8	7.7	8.0	7.4	2.1	2.4	1.8	0.6	0.8	0.4
Finland	22.4	14.0	31.2	8.0	9.6	6.4	12.7	11	14.4	x	x	x	2.0	2.2	1.7
France	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Germany	12.3	10.8	13.9	a	a	a	15.7	17.7	13.5	a	a	a	1.6	2.1	1.0
Greece	4.5	x	x	x	x	x	14	x	x	0.3	x	x	0.4	x	x
Hungary	a	a	a	17.7	15.2	20.4	x	x	x	4.3	5.1	3.5	0.2	0.2	0.1
Iceland	m	m	m	17.4	10.9	24.2	m	m	m	m	m	m	m	m	m
Ireland	14.3	15.2	13.3	10.4	8.9	12.0	10.1	10.4	9.8	9.8	9.2	10.3	1.0	1.2	0.7
Italy	7.3	5.2	9.4	0.8	0.6	1.0	10.7	9.9	11.5	a	a	a	1.6	1.8	1.4
Japan	28.6	17.3	40.4	23.1	30.8	15.1	x	x	x	1.9	3.1	0.7	0.4	0.7	0.1
Korea	16.3	17.2	15.4	23.3	26.4	20.1	x	x	x	3.0	4.2	1.8	0.5	0.8	0.2
Luxembourg	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Mexico	x	x	x	x	x	x	11.1	11.2	11.0	x	x	x	x	x	x
Netherlands	a	a	a	x	x	x	19.0	17.6	20.5	a	a	a	1.9	2.2	1.5
New Zealand	16.8	11.8	21.7	20.5	17.1	24.0	5.1	5.1	5.2	9.8	10.3	9.3	0.5	0.7	0.3
Norway	47.6	42.3	53.2	17.2	11.9	22.8	5.4	5.1	5.7	8.4	9.4	7.4	0.9	1.2	0.5
Poland	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
Portugal	6.3	4.1	8.4	1.6	1.1	2.1	13.3	9.9	16.7	1.2	1.3	1.2	1.2	1.3	1.2
Russian Federation	25.9	x	x	20.8	x	x	x	x	x	a	a	a	0.7	0.7	0.6
Spain	1.9	1.9	2.0	10.3	7.9	12.9	13.7	11.7	15.7	x	x	x	0.9	1.0	0.7
Sweden	9.2	5.8	12.7	8.1	5.6	10.8	7.6	8.6	6.5	2.8	2.2	3.5	1.7	2.3	1.1
Switzerland	22.7	30.7	14.9	x	x	x	9.0	11.4	6.8	a	a	a	3.1	4.1	2.0

Turkey	2.9	2.8	3.0	7.7	9.6	5.8	x	x	x	0.6	0.7	0.5	0.2	0.3	0.1
United Kingdom	17.1	12.1	22.3	30.9	29.7	32.2	x	x	x	11.2	11.0	11.4	0.9	1.3	0.6
United States	22.2	18.2	26.4	32.0	28.5	35.7	x	x	x	12.0	11.2	12.8	1.2	1.4	0.9

a = Data not applicable.

m = Data not available.

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development.
Education at a Glance: OECD Indicators, 1997, Table G2.1.

Table B4.2: Distribution of higher education degrees by subject area, by level of education and country: 1995 (Figure 4.9)

	Medical science		Natural science		Mathematics and computer science		Humanities/general		Law and business		Engineering and architecture	
Country	Non-university	University	Non-university	University	Non-university	University	Non-university	University	Non-university	University	Non-university	University
Australia	m	15	m	11	m	4	m	38	m	26	m	7
Austria	16	10	n	12	1	5	61	30	12	30	10	13
Belgium	m	m	m	m	m	m	m	m	m	m	m	m
Canada	9	7	3	8	2	4	36	56	49	18	n	8
Czech Republic	20	11	1	11	n	2	11	42	62	14	6	22
Denmark	4	19	6	5	n	2	39	30	38	25	14	19
Finland	52	11	10	9	5	7	7	36	7	12	19	26
France	m	m	m	m	m	m	m	m	m	m	m	m
Germany	33	9	6	12	1	5	27	40	10	13	23	21
Greece	m	m	m	m	m	m	m	m	m	m	m	m
Hungary	a	13	a	7	a	2	a	40	a	22	a	16
Iceland	m	m	m	m	m	m	m	m	m	m	m	m
Ireland	1	5	16	17	7	5	9	39	40	23	27	11
Italy	m	22	m	9	m	3	m	25	m	29	m	12
Japan	10	5	14	10	x	x	33	26	23	37	19	21
Korea	11	5	9	17	x	x	m	m	m	m	37	18
Luxembourg	m	m	m	m	m	m	m	m	m	m	m	m
Mexico	m	m	m	m	m	m	m	m	m	m	m	m
Netherlands	a	12	a	7	a	2	a	45	a	34	a	x
New Zealand	15	9	5	17	n	1	46	38	30	30	3	5
Norway	1	20	1	7	1	1	67	36	30	15	n	18
Poland	m	m	m	m	m	m	m	m	m	m	m	m
Portugal	22	6	4	5	2	3	22	47	38	27	12	12
Russian Federation	m	7	m	14	m	7	m	31	m	12	m	28
Spain	7	12	2	6	1	4	10	29	48	37	33	11
Sweden	36	10	2	7	2	6	36	36	9	24	15	17
Switzerland	m	14	m	16	m	4	m	25	m	30	m	12
Turkey	36	9	5	10	2	2	7	50	23	13	28	15
United Kingdom	37	8	4	10	5	5	22	40	22	23	11	14

United States	21	9	5	8	2	3	33	46	32	26	6	8

a = Data not applicable.
m = Data not available.
n = Magnitude is either negligible or zero
x = Data included in another category.

NOTE: Figures represent proportions of non-university higher education graduates and, separately, university graduates with degrees in the various categories of degrees. Row figures may not sum to 100, due to rounding.
SOURCE: Organization for Economic Co-operation and Development,
Education at a Glance: OECD Indicators, 1997, Table G3.1.

Table B4.3: Percentages of higher education degrees awarded to females, by subject area, level of education, and country: 1995 (Figures 4.10a and 4.10b)

	Medical science		Natural science		Mathematics and computer science		Humanities/general		Law and business		Engineering and architecture	
Country	Non-university	University	Non-university	University	Non-university	University	Non-university	University	Non-university	University	Non-university	University
Australia	m	79	m	45	m	32	m	70	m	47	m	19
Austria	86	55	100	39	32	22	75	61	77	41	38	13
Belgium	82	61	46	42	22	25	71	62	48	48	52	23
Canada	67	70	31	51	42	29	60	65	36	48	n	18
Czech Republic	89	62	66	40	n	18	59	64	65	55	38	26
Denmark	79	88	5	46	n	29	68	64	17	40	13	25
Finland	91	67	57	47	28	13	69	74	87	52	14	15
France	m	m	m	m	m	m	m	m	m	m	m	m
Germany	78	46	30	37	27	29	84	55	27	45	6	14
Greece	m	m	m	m	m	m	m	m	m	m	m	m
Hungary	a	m	a	m	a	m	a	m	a	m	a	m
Iceland	m	m	m	m	m	m	m	m	m	m	m	m
Ireland	84	56	55	51	37	29	56	66	63	49	9	17
Italy	m	48	m	49	m	49	m	76	m	48	m	24
Japan	85	40	96	36	x	x	86	64	63	19	18	5
Korea	73	40	75	51	x	x	m	m	m	m	22	7
Luxembourg	m	m	m	m	m	m	m	m	m	m	m	m
Mexico	m	m	m	m	m	m	m	m	m	m	m	m
Netherlands	a	69	a	35	a	13	a	61	a	32	a	x
New Zealand	91	71	38	43	44	22	72	66	53	45	15	28
Norway	87	81	46	43	33	22	59	69	47	43	20	20
Poland	m	m	m	m	m	m	m	m	m	m	m	m
Portugal	82	69	49	57	41	51	86	72	64	57	26	31
Spain	67	72	37	50	1	35	88	69	54	38	18	4
Sweden	87	62	11	49	20	21	85	71	31	51	17	22
Switzerland	m	42	m	32	m	13	m	56	m	32	m	15

Turkey	84	45	53	44	28	45	39	38	52	35	12	25
United Kingdom	90	67	44	46	26	27	63	63	57	48	13	18
United States	82	72	62	49	50	33	56	63	53	46	12	18

a = Data not applicable.
m = Data not available.
n = Magnitude is either negligible or zero.
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development. *Education at a Glance: OECD Indicators*, 1997, Table G3.2.

Table B4.4: Rate of labor force participation for the population aged 25 to 64 years, by level of educational attainment and country: 1995 (Figure 4.11)

Country	Non-university higher education	University education	All levels, elementary, secondary and higher education
Australia	84		75
Austria	86	91	74
Belgium	85	89	69
Canada	84	89	78
Czech Republic	x	93	81
Denmark	92	93	82
Finland	85	92	80
France	89	87	77
Germany	87	90	75
Greece	84	87	67
Ireland	85	88	67
Italy	x	87	63
Korea	x	82	74
Luxembourg	x	89	66
Netherlands	a	86	71
New Zealand	81	89	77
Norway	88	93	82
Poland	86	87	74
Portugal	88	94	75
Spain	88	87	66
Sweden	92	94	91
Switzerland	92	92	82
Turkey	x	77	68
United Kingdom	86	91	79
United States	86	89	79

a = Data not applicable.
x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table E1.1a.

Table B4.5: Rate of labor force participation for the population 25 to 64 years of age, by level of educational attainment, sex, and country: 1995 (Figure 4.12)

	Non-university		University		All levels*	
Country	Male	Female	Male	Female	Male	Female
Australia	91	75	94	84	88	63
Austria	88	85	94	86	85	63
Belgium	91	81	92	84	81	57
Canada	90	78	93	85	86	70
Czech Republic	x	x	94	90	88	75
Denmark	93	91	95	91	87	78
Finland	87	84	93	89	83	77
France	94	85	92	81	85	68
Germany	90	82	93	83	86	65
Greece	90	76	91	82	87	48
Ireland	95	76	94	81	86	49
Italy	x	x	92	82	81	45
Korea	x	x	96	54	93	55
Luxembourg	x	x	93	81	84	47
Netherlands	a	a	91	81	84	58
New Zealand	92	75	94	81	88	67
Norway	91	84	95	91	88	77
Poland	91	85	90	85	82	67
Portugal	94	86	94	93	86	65
Spain	94	77	91	84	84	47
Sweden	92	92	95	93	93	88
Switzerland	96	77	96	82	95	70
Turkey	x	x	84	62	95	33
United Kingdom	91	82	93	87	87	70
United States	92	82	94	83	88	71

*Includes elementary, secondary, and higher education.

a = Data not applicable.

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table E1.1b.

Table B4.6: Employment/ population ratio and unemployment rate for 25-64 year-olds, by level of educational attainment and country: 1995 (Figure 4.13)

	Employment/ population ratio		Unemployment rate		All levels of education*	
Country	Non-university	University	Non-university	University	Employment/ population ratio	Unemployment rate
Australia	79	86	5.1	3.3	71	6.6
Austria	85	89	1.4	2.1	71	3.5
Belgium	82	86	3.5	3.6	63	8.5
Canada	78	85	7.5	4.6	71	8.3
Czech Republic	x	92	x	0.7	79	2.7
Denmark	87	89	5.3	4.3	74	10.0
Finland	77	86	9.7	6.2	67	15.8
France	84	81	5.9	7.0	69	9.7
Germany	83	85	5.2	4.7	69	8.1
Greece	75	81	10.1	7.1	60	7.4
Hungary	m	m	m	m	m	m
Iceland	m	m	m	m	m	m
Ireland	81	85	5.0	3.4	60	10.7
Italy	x	81	x	7.3	57	8.5
Japan	m	m	m	m	m	m
Korea	x	80	x	2.0	73	1.4
Luxembourg	x	88	x	0.6	64	3.0
Mexico	m	m	m	m	m	m
Netherlands	a	83	a	4.1	67	5.6
New Zealand	78	87	3.6	2.6	74	4.5
Norway	85	92	3.4	1.7	79	3.9
Poland	80	85	6.9	2.8	66	10.7
Portugal	86	91	3.1	3.3	70	5.8
Spain	73	75	16.6	13.8	53	19.0
Sweden	88	90	4.8	4.2	84	7.8
Switzerland	91	89	1.5	2.6	80	3.0
Turkey	x	74	x	3.3	65	5.0
United Kingdom	82	88	4.1	3.5	73	7.4
United States	83	87	3.6	2.5	76	4.7

* "All levels of education" includes all adults 25-64 years old, from those with less than an upper secondary education to those with university degrees.

a = Data not applicable.

m = Data not available.

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table E2.1a.

Table B4.7: Relative earnings of persons aged 25-64 with income from employment at different levels of educational attainment relative to the upper secondary level, by level of education, sex, and country: 1995 (Figure 4.14)

	Non-university			University		
Country	M + F	Male	Female	M + F	Male	Female
Australia	111	118	105	142	161	139
Canada	110	108	113	156	148	163
Czech Republic	x	x	x	158	154	149
Denmark	104	108	110	133	139	130
Finland	126	127	126	187	190	174
France	128	132	137	175	183	168
Germany	111	107	116	163	158	154
Ireland*	123	121	123	183	171	187
Italy	x	x	x	134	142	120
Netherlands	124	126	131	162	153	158
New Zealand	106	98	102	165	163	146
Norway	123	125	124	149	149	150
Portugal	x	x	x	183	180	174
Sweden	109	111	112	151	154	144
Switzerland	145	124	134	157	141	156
United Kingdom	132	114	151	179	153	195
United States	119	118	126	174	167	176

*1993 data

x = Data included in another category.

SOURCE: Organization for Economic Co-operation and Development, *Education at a Glance: OECD Indicators*, 1997, Table E4.1a.

Table B4.8: Percentage of adults who scored at prose literacy levels 4 or 5*, by level of educational attainment and country: 1995 (Figure 4.15)

Country	Non-university	University	Upper-secondary
Belgium	30.9	44.5	13.2
Canada	27.6	54.6	20.5
Germany	27.5	39.0	15.3
Ireland	24.6	42.9	16.7
Netherlands	m	34.1	19.9
New Zealand	33.1	46.8	22.8
Poland	9.2	17.0	4.1
Sweden	47.2	58.8	30.9
Switzerland (French)	12.0	31.5	7.9
Switzerland (German)	10.7	25.7	10.0
United Kingdom	25.8	44.7	19.3
United States	27.3	49.5	14.4

* According to the International Adult Literacy Survey (IALS), *prose literacy* includes text from newspapers, pagazines, and brochures accompanied by one or more questions or directives asking the reader to perform specific tasks. These tasks represent three major aspects of information processing: locating, integrating, and generating. Locating tasks require the reader to find information in the text pased on conditions or features specified in the questions or directive. Integrating tasks ask the reader to pull together two or more pieces of information in the text. Generating tasks ask the reader to produce a written response by processing information from the text, making text-based references, and drawing on background knowledge.

Prose Level 4: These tasks require readers to perform multiple-feature matching or to provide several responses where the requested information must be identified through test-based inferences. Tasks at this level may also require the reader to integrate or contrast pieces of information that are sometimes presented in relatively lengthy texts. Typically, these texts contain more distractig information, and the information that is requested is more abstract.

Prose Level 5: Some tasks at this level require the reader to search for information in dense text that contains a number of plausible distracters. Some tasks require readers to make high-level inferences of use specialized knowledge.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Condition of Education, 1998, Temporary table, IAL-2; Statistics Canada, International Adult Literacy Survey.

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Table B4.9: Mean mathematics achievement for students in the eighth grade, by parents' highest level of educational attainment: 1995

(Figure 4.16)

Country	Finished university	Finished upper secondary school, but not university
Australia	572	528
Canada	544	526
France	576	549
Germany	553	526
Russian Federation	565	526
Scotland	559	499
Spain	517	502
Sweden	544	524
Switzerland	588	552
United States	527	494

SOURCE: International Association for the Evaluation of Education Achievement (IEA), Third International Mathematics and Science Study, *TIMMS International Database,* 1995.

Table B4.10: Mean science achievement for students in the eighth grade, by parents' highest level of educational attainment: 1995 (Figure 4.17)

Country	Finished university	Finished upper secondary but not university
Australia	587	544
Canada	549	532
France	524	505
Germany	573	550
Russian Federation	567	528
Scotland	579	521
Spain	547	531
Sweden	561	541
Switzerland	559	531
United States	562	530

SOURCE: International Association for the Evaluation of Education Achievement (IEA), Third International Mathematics and Science Study. *TIMMS International Database*, 1995.

Table B4.11: Percent probability of attaining at least a post-secondary level of education among 26- to 35-year olds, by parents' highest level of educational attainment and country: 1995

(Figure 4.18)

Country	Postsecondary degree	All levels	Difference
Australia	46.5	29.0	17.5
Belgium (Flemish)	59.2	35.0	24.2
Canada	69.0	41.2	27.8
Ireland*	57.4	18.9	38.5
Netherlands	53.1	23.5	29.6
New Zealand	53.8	31.5	22.3
Poland	58.4	16.8	41.6
Sweden	48.3	28.6	19.7
Switzerland	43.2	23.2	20.0
United Kingdom	57.6	25.3	32.3
United States	71.3	45.1	26.2

*The age group for Ireland includes all adults aged 26 to 55.

SOURCES: (1) Kristen Underwood and Patrice de Broucker, Centre for Education Statistics, Statistics Canada.

(2) International Adult Literacy Study.

Table B5.1: Total and higher education share of R&D expenditures (in million 1990 $, converted using purchasing power parities), percentage by source of funds and country: 1995 (Figures 5.1-2)

	Sources of R&D funds					
	Industry	Government	Higher Education	Private nonprofit	Funds from abroad	Percent distribution
Australia (1994), total						
Percent distribution total, sources	46.3	47.5	0.2	4.0	2.0	100.0
Higher education						
Percent distribution, higher education	3.5	91.6	m	3.9	1.0	24.6
Canada, total						
Percent distribution total, sources	46.8	35.1	2.9	2.6	12.6	100.0
Higher education						
Percent distribution, higher education	10.3	67.2	12.6	9.1	0.8	22.7
France, total						
Percent distribution total, sources	48.3	42.3	0.8	0.5	8.0	100.0
Higher education						
Percent distribution, higher education	3.3	90.6	4.0	0.5	1.6	16.7
Germany, total						
Percent distribution total, sources	60.5	37.4	m	0.4	1.7	100.0
Higher education						
Percent distribution, higher education	7.9	90.9	m	0.0	1.2	18.9
Italy, total						
Percent distribution total, sources	44.5	51.2	m	m	4.3	100.0
Higher education						
Percent distribution, higher education	5.6	92.0	m	m	2.4	25.1
Japan, total						
Percent distribution total, sources	72.2	20.5	6.5	0.6	0.1	100.0
Higher education						
Percent distribution, higher education	2.3	52.4	45.1	0.2	m	14.5
Spain, total						
Percent distribution total, sources	44.5	43.6	4.4	0.8	6.7	100.0
Higher education						
Percent distribution, higher education	8.3	70.4	13.7	0.5	7.1	32.0
Sweden, total						
Percent distribution total, sources	m	m	m	m	m	m
Higher education						
Percent distribution, higher education	4.6	83.6	3.0	6.1	2.6	22.0
Switzerland (1992), total						
Percent distribution total, sources	67.4	28.3	0.9	14.3	1.9	100.0
Higher education						
Percent distribution, higher education	1.8	91.6	3.5	3.1	m	25.0
United Kingdom, total						
Percent distribution total, sources	48.0	33.3	0.8	3.5	14.3	100.0
Higher education						
Percent distribution, higher education	6.2	67.7	4.2	14.1	7.8	18.8
United States, total						
Percent distribution total, sources	59.9	36.1	2.2	1.8	0.0	100.0
Higher education						
Percent distribution, higher education	5.5	74.0	14.6	5.9	0.0	15.2

m = data assumed negligible or no data available.

SOURCE: Organization for Economic Co-operation and Development, R & D Database, 1998.

Table B5.2: Total and higher education R&D expenditures (in million 1995 $, converted using purchasing power parities) per capita, by country: 1995 (Figure 5.3)

	Population (millions)	Total R & D spending per capita	Higher education R & D spending per capita
Australia (1994)	18.3	302.9	74.6
Canada	28.4	359.5	81.7
France	58.1	465.6	77.8
Germany	81.3	471.6	89.1
Italy	58.3	198.4	49.8
Japan	125.5	604.8	87.5
Spain	39.4	119.9	38.4
Sweden	8.8	675.0	148.2
Switzerland (1992)	7.1	251.1	62.7
United Kingdom	58.3	366.8	69.0
United States	263.8	679.0	103.5

m = data assumed negligible or no data available.

SOURCE: Organization for Economic Co-operation and Development, R & D Database, 1998; U.S. Bureau of the Census, *Statistical Abstract, 1997*, Table 1361, pp.845-847.

APPENDIX C
TECHNICAL NOTES

Appendix C: Technical Notes

Note on the number and size of institutions

Note on enrollment and completion ratios

Note on expenditure comparisons

Note on apprenticeships in the United States and Germany

APPENDIX C

TECHNICAL NOTES

Notes on the number and size of institutions

Country notes

All countries

Vocational-technical colleges are included where information for them is available, but worksite programs, job training centers, and apprenticeship programs and their students are not unless otherwise specified. Adult education and correspondence programs are also excluded unless otherwise specified.

Generally, free-standing art and design schools are included at the higher education level where it is clear that the institutions were free-standing institutions, separate from universities.

Higher education enrollments are headcounts. Thus, part-time students are counted as equivalent to full-time students.

Australia

Special education schools and students are included, as there was not enough information in sources by which to separate them out. Technical and Further Education (TAFE) schools are free-standing (i.e., not worksite programs) and are considered to be non-university higher education.

Sources: Australian Bureau of Statistics, ***Schools Australia***, 1992, Table 2. APEC.

Canada

Source: Statistics Canada, ***Education in Canada***, 1996, No. 81-229-XIB., pp. 23, 50.

France

Sources: National Ministry of Education, Research, and Technology. Direction de l'Evaluation Et de La Prospective, ***Note d' Information: Les classes preparatoires aux grandes ecoles***, 1997, pp.1-2. National Ministry of Education, Research, and Technology. Direction de l'Evaluation Et de La Prospective, ***Note d' Information: Les sections de techniciens superieurs (establishments publics et prives)***, 1997, pp.1-2. ***www.education.gouv.fr/syst/orgs6b.htm.***

Etudiants=2,167,436 dont 1,485,583 dans les universites et les ecoles d'ingenieurs dependantes des universites. Statistiques (1995-96) et dans France metropolitaine + DOM.

Germany

University counts include both universities and fachhochschulen, ISCED 6 and 7 institutions. Non-university higher education counts only include kunsthochschulen, or art schools, ISCED 5.

Sources: *Der Bundesminister fur Bildung und Wissenschaft,* ***Grund-Und Strucktur Daten***, 1996-97, pp.145, 153.

Italy

University-level counts include students enrolled in programs that offer the Diplome (2-3 year program) and Laurea (5 year program). Both are considered to be at ISCED level 6 and 7.

Source: *Instituto Nazionale di Statistica (ISTAT).* ***Statistiche dell'istruzione universitaria, anno accademico 1993-94***, collana d'informazione edizione 1995, no. 3, pp. 11, 18, 19, 33.

Japan

Special Training Schools, Miscellaneous Schools, and correspondence schools are excluded, but correspondence students at regular higher education institutions are counted. Non-University higher education institutions consist of colleges of technology and junior colleges.

Sources: Ministry of Education, Science and Culture, ***Monbusho***, 1996, p.17.

Russian Federation

Source: State Committee on Science and Technology and the Russian Academy of Science, Centre for Science Research and Statistics, ***Higher Education in Russia, Data Book,*** 1996, p. 17.

Spain

Only universities were counted. The number of and enrollment in non-university higher education institutions are significantly smaller.

Source: Ministerio de Educacion Y Cultura, Consejo de Universidaes, ***Estadisticos Universtaria, curso*** 1996-97, p. 37.

Sweden

Includes universities that fall under the responsibility of the Ministry of Education and Science and the Ministry of Agriculture.

Sources: Organisation for Economic Co-operation and Development, ***Review of National Policies for Education: Sweden***, 1995, p 53. Swedish Ministry of Education and Science, *Strategies for Education Research*, 1995, p 21.

Switzerland

Source: Garke, E. In W. Wichremasinghe (Ed.), ***Handbook of world education***, 1992, p. 153-4.

United Kingdom

Only universities were counted at the ISCED 6 level. While some colleges of higher education are at ISCED level 6, they were all included at ISCED level 5 since the indicator for colleges of higher education did not differentiate between ones at ISCED levels 5 and 6.

Students numbers represent both full-time, sandwich (internships), and part-time students and exclude further education students.

Sources: ***Structures of the Education and Initial Training Systems in the European Union*: *England and Wales,*** EURYDICE/CEDEFOP, 1995, p. 24. ***Structures of the Education and Initial Training Systems in the European Union: Scotland,*** EURYDICE/DEEFOP, 1995, p. 44-46.

United States

Both 4-year colleges and universities are counted at the university (ISCED 6,7) level here. Two-year degree-granting institutions (e.g., community colleges) are considered non-university higher education institutions (ISCED 5).

Source: U.S. Department of Education, National Center for Education Statistics, ***Digest of Education Statistics***, *1997*, Table 209.

Problems in comparing the number of institutions and their sizes across countries

Substantial variation in how countries count students and institutions, and in which students and institutions they count, create problems in comparing their institution sizes. The variation tends to arise chiefly in the specialized areas of education. These areas include: special education; adult education; vocational and technical education; correspondence programs; and private schools.

Some countries, for example, simply do not consider special education to be the responsibility of the education ministry, rather it is assumed by a human services ministry. Programs outside the purview of the education authorities tend not to have good statistical accounting in data collections managed by public education authorities.

The exact location of each "boundary" between level and types of education also varies from country to country and even within each country. In Canada, for example, vocational/technical students in Québec who so choose enter vocational/technical college in the 12th grade. In the other Canadian provinces with vocational/technical colleges, entry is at the 13th or the 14th grade. Thus, vocational/technical students in the other provinces spend more time at the upper secondary level. The more time the average student spends in a level of education, the greater will be the number of students at that level. This can affect school or institution size.

In order to improve comparability in the institution size statistics, the following decisions have been made with regard to the data:

- Types of institutions are excluded if their exact number or their number of students could not be determined. All efforts were made to avoid double-counting of institutions.

- Programs are excluded if it cannot be determined precisely how to allocate students and institutions between levels of education. This issue arises particularly with vocational-technical programs, which straddle the secondary and higher education levels in some countries, not laying wholly in one level or the other.

- Each country's own definition for which grades or age-groups comprise the different levels of education have been accepted, because countries count their students and schools within their own classification systems. It should be remembered, though, that the break point between levels of education varies across countries and even within countries. Thus, in comparing two countries' by a particular level of education, one may actually be comparing two different grade-level groups or age groups.

- Only those programs that each country considers to be "education" programs have been counted. This issue arises in some country or another with special education, adult and continuing education, and even vocational education.

- Since some countries do not count worksite programs, technical training centers, and apprentice programs and their students, these activities are excluded from all calculations here. Adult education and correspondence schools are also excluded.

- Where possible, free-standing special education schools are excluded, because some countries do not count them as part of their "education" statistics, whereas others do. Moreover, double-counting could emerge as a problem if students spend part of their time at a regular school and the other part at a special school. Moreover, double-counting could be a problem with apprentice programs if students are counted once at their regular school and then again at their worksite.

- Countries with long first higher education programs have begun to create shorter programs. While other countries may consider these programs non-university level, or ISCED 5 (e.g., the United States' community colleges), countries with long first programs still include their shorter programs as part of university education (e.g., Italy's Diplome programs). Even if the enrollments between these types of education are differentiated, it is difficult to calculate the average institution size without double counting the institutions.

Problems in calculating the number and size of higher education institutions: headcount versus full-time-equivalent enrollment counts

Another comparability problem—that of headcount versus full-time-equivalence (FTE) enrollments—can represent a major problem at the higher education level. A headcount enrollment counts every student as one student regardless of the level of participation. Theoretically, a student who takes one hour a week of class at a university could be counted as one student just as a full-time student, taking fifteen hours a week of class would be. In practice, however, some education authorities impose a minimum participation threshold on the numbers in order to not count the most casual students. All students participating, say, at least half-time, might get counted as students in the head count.

Full-time equivalency would count part-time students as partial students, and their weight in the count would be determined by the degree of their participation in school. A half-time student would get counted as a 0.5 student rather than 1. A quarter-time student would get counted as a 0.25 student, and so on. FTE counts give a more accurate picture of the size of an institution as it is practically being used.

If there are any part-time students, full-time-equivalent counts are lower than headcounts at the same institution.

Since all but three of the countries publish headcounts exclusively, we used headcounts in this report. Three countries, however, did publish their numbers of part-time students along with their full-time numbers. Counting the part-time students, somewhat arbitrarily, as 0.5 students, we can calculate an FTE enrollment for these countries, Canada and the United States. Table C.1 displays these FTE enrollments for the average higher education institution in each country, next to the equivalent headcount enrollment.

As the table below shows, using FTE enrollments rather than headcounts does not affect the relative ranking of school sizes across these three countries, but it is conceivable that it could make a difference with a larger sample of countries. Part-time students make up a larger proportion of the student population in the United States than in the United Kingdom or Canada, for example. The proportion of part-time students in a student population may vary across other countries as well and, so long as it does, the two different accounting methods—head count and FTE—can produce different school size rankings.

Table C.1: Average size of higher education institutions, by counting method and country: Various years

Country	Headcount enrollment	Full-time equivalent enrollment
Canada, 1994-95	4,806	4,034
United Kingdom, 1992	7,295	5,831
United States, 1995	4,023	3,450

SOURCE: See country notes above.

Threat to reliability inherent in language translation

Finally, it must be considered that misunderstandings could occur at any point where country statistical reports were translated from one language to another.

The statistical reports used from Australia, Canada, the United Kingdom, and the United States were written in their original form in English. The statistical reports used from Japan, the Russian Federation, and Sweden were translated into English by officials in those countries. The statistical reports used from France, Switzerland, Spain, Italy, and Germany were read in French, Italian, Spanish, or German and translated by the author (in the case of France, Switzerland, and Spain) or by the author with assistance (in the case of Germany and Italy).

Note on enrollment and completion ratios

Enrollments

Enrollment ratios allow comparisons across states and countries by standardizing enrollment in education at a particular level to the size of the population in an age group typical for enrollment in that level. The ratio should not be interpreted as an enrollment *rate* (that is, as the percent of students in a particular age range who are enrolled at that level of education). This ratio compares the number of students enrolled in particular levels of education to the number of people in the age *ranges* that represent the usual ages of students at those levels of education. More importantly, the *width* of the age range best approximates the average duration of study at these levels of education.

The ratio is calculated by dividing the number of students of *any* age enrolled in particular levels of education by the population in the *enrollment reference group* (the population in the age range typical for enrollment at those levels) and multiplying by 100:

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$$\text{enrollment ratio} = \frac{\text{students of any age enrolled in education level}}{\text{population in enrollment reference group}} \times 100$$

This ratio thus represents the number of enrolled students per 100 people in the enrollment reference group. Under some conditions the enrollment ratio would be a fairly good estimate of the enrollment rate. For example, if in a particular country all students begin primary (elementary) education at nearly the same age, say 6, and if grade retention, repetition, and skipping is rare, then the ratio of students enrolled in grades 1 through 6 divided by the number of children between the ages of 6 and 11 would be a good estimate of the enrollment rate in elementary education. However, these conditions rarely hold for enrollment in higher education, and often do not hold for enrollment in upper secondary (high school) education.

To identify enrollment reference groups for each country, countries specified an age typical for beginning education at each level and the number of years typically required for completing education at each level. If this number of years is less than the actual average number of years required for completing education at that level, then, in a sense, the population reference group is too small, and the ratios too large. This is more likely to be a factor in education systems where retention and repetition are common, where a substantial number of students attend part-time, or where a substantial number of students enter the system again even after already earning a credential at that level.

Fortunately, because the sizes of different age cohorts within the same general age range are approximately equal, an enrollment ratio is relatively insensitive to the selection of the age typical for beginning students, but relatively sensitive to the selection of the age range or typical duration of education at that level. For example, dividing the number of students enrolled in upper secondary school in Norway by the population in the 16- to 18-year-old age range would yield almost the same result as dividing it by the population in the 17- to 19-year-old age range, an age range of 3 years in both cases. The reason is that the population of 16-year-olds and 19-year-olds are likely to be similar and so the result insensitive to whether one includes one age cohort or the other in the population reference group. However, dividing by the population of 16- to 19-year-olds, an age range of 4 instead of 3, would yield a substantially (approximately 25 percent) smaller ratio. So it is important that the age range in the population reference group be a close approximation of the actual average duration required to complete a particular level of education.

Tables A.1, A.4, A.5, and A.6 in Appendix A: Basic Reference Tables show countries' reference age groups, enrollment reference groups, and higher education entry and graduation reference ages.

Higher education completion

Similarly, the numbers of higher education degree recipients were standardized for comparison purposes as ratios of higher education graduates per 100 people at the *graduation reference age*. Even though many students receive degrees at ages other than the graduation reference age, the ratio nevertheless allows useful comparisons across countries because it places the number of graduates in relation to the size of a typical cohort of students. Assuming that the sizes of different age cohorts within the same general age range are approximately equal, the ratio will not be significantly affected if large numbers of students receive degrees at ages other than the graduation reference age. This measure may include some graduates receiving second higher education degrees.

Entry to higher education

Similarly, the numbers of entering students were standardized for comparison purposes as ratios of new entrants per 100 people at the *entry (or, starting) reference age*. Even though many students enter higher education at ages other than the entry reference age, the ratio nevertheless allows useful comparisons across countries because it places the number of new entrants in relation to the size of a typical cohort of students. Assuming that the sizes of different age cohorts within the same general age range are approximately equal, the ratio will not be significantly affected if large numbers of students enter higher education at ages other than the entry reference age. It will, however, be significantly affected if large numbers of students *re-enter* university for second higher education degrees (entrants to graduate programs are not included).

Note on expenditure comparisons

How expenditures are compared across countries

To compare public expenditure per student in the United States with expenditures per student in other countries, expenditures must be converted to a common currency.

Purchasing Power Parity Indices (PPPI) are calculated by comparing the cost of a fixed market basket of goods in each country. Changes over time in a PPPI are determined by the rates of inflation in each country. A PPPI is not as volatile as market exchange rates.[1] Measures of education expenditure and GDP/GSP used in this report have been adjusted with a PPPI.

Because the fiscal year has a different starting month in different countries, within-country consumer price indexes (CPI) calculated by the International Monetary Fund were used to adjust educational expenditure data to allow for inflation between the starting month of the fiscal year and July 1, 1994.

Problems in comparing education expenditures across countries

There exists some variation in the coverage and the character of the education expenditure data that countries submit to the OECD. Sometimes, an individual expenditure item may be included in the expenditure data from one country, but not included in the expenditure data from another. Discrepancies arise because one country may collect certain kinds of data that another country either does not collect, or does not collect in its "education" data collections. Or, one country may define what constitutes an "education" expenditure differently than another country does.

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[1] For a further argument against using market exchange rates, see Rasell, Edith M. and Lawrence Mishel, ***Shortchanging Education***, Economic Policy Institute, January 1990.

Discrepancies between which expenditure items are included in one country's expenditure figures and not in another's tend to arise in three general domains:

- **Non-instructional (or, ancillary) services**—Some countries provide fewer ancillary services in their schools and, thus, include fewer expenditures for such services in their education expenditure figures. Examples of ancillary services are: school cafeterias; dormitories; school sports programs; school health clinics or visiting school nurses; attendance (i.e. truancy) services; and speech or psychological therapy services. U.S. schools tend to subsidize relatively more ancillary services through their education budgets than do schools in most other countries. In some countries (e.g. Germany), *none* of the aforementioned services are provided at the primary and lower secondary levels by many schools.

- **Private expenditures**—Some countries' education systems receive large private contributions. The most common forms of private contributions to education are student tuition or fees; organizational subsidies, such as those provided by religious denominations to their own schools; and corporate in-kind contributions, such as those provided by German and Austrian firms that provide vocational courses on the shop floor for participating youth apprentices. Private expenditures have not been included in the indicators used in this report, in part because precise figures for private education expenditures are not available for the U.S. nor for several other countries.

- **The boundaries of education**—There exist fewer (though, still some) inconsistencies in comparing just the *instructional* expenditures for *primary and secondary public* education in just the *academic* track. But, the specialized areas of education cause comparability problems. These areas include: preprimary education and daycare; special education; adult education; vocational and technical education; and proprietary education. Some countries, for example, simply do not collect expenditure data for private "center-based" daycare as they do not define such to be "education." Indeed, in some countries, even public daycare is not managed by education authorities; rather, it is the responsibility of human services departments.

The exact location of each "boundary" also varies from country to country and even within each country. In Canada, for example, vocational/technical students in Québec who so choose enter vocational/technical college in the 12th grade. In the other Canadian provinces with vocational/technical colleges, entry is in the 13th or the 14th grade. Thus, vocational/technical students in the other provinces spend more another year or two at the upper secondary level. The more time the average student spends in a level of education, the greater will be the expenditure at that level.

Even these three domains do not include all the possible comparability problems. There remain, for example, inconsistencies in how different countries treat public contributions to teacher retirement and fringe benefits, student financial aid, and university research and hospitals.

The National Center for Education Statistics (NCES) sponsored two studies designed to examine the issue of the comparability of national figures of education expenditure. The studies, entitled ***International Education Expenditure Comparability Study: Final Report***, Volumes I and II, involved ten countries and examined, in detail, the content of their education expenditures, as they were reported to the OECD.[2]

Thus far, participating education ministries have been receptive to the idea of improving comparability in the OECD data collection. Indeed, most countries have modified their data submissions to the OECD for subsequent years, thus improving the comparability of education expenditures across countries for the data collection used in this report. These changes were motivated in part by preliminary findings from the NCES expenditure comparability studies.[3]

Note on apprenticeship in the United States and Germany

Apprenticeship in the United States and Germany

Apprenticeship programs enroll a significant proportion of upper secondary students in many OECD countries. Apprenticeship is a method of teaching job-related skills through hands-on, work-based training. Skills are developed as the apprentice observes, assists, and is taught by one or more skilled workers, assuming responsibility for progressively more challenging tasks until all the necessary skills are mastered. Although the workplace is the principal location for training, related theoretical instruction is also part of the curriculum. Typically, the standards for completing an apprenticeship are explicitly stated and apprentices meeting those standards are certified to practice a particular occupation.

Apprenticeship systems in the United States and Germany are in many ways the polar opposites of each other. The similarities and differences between apprenticeship programs in these two countries highlight many of the ways in which these programs vary between countries. The United Kingdom and Canada have apprenticeship systems that are in many ways similar to that in the United States, while Austria, Denmark and Switzerland have systems similar to the one in Germany.

Apprenticeship in the United States

Apprenticeship programs in the Untied States operate primarily as training for young adults (typically in their late 20s), providing upgrading and retraining for those who are already employed. Apprenticeship programs can be sponsored by employers, employers' associations, or jointly by employers and unions. Apprenticeship programs are not closely linked with school-based vocational and technical education.

In general, apprenticeship is not widely used as a training strategy. Two-thirds of all U.S. apprentices are in 20 of the 830 apprenticeable occupations; and of those 20 occupations, all but three

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[2] U.S. Department of Education, National Center for Education Statistics. International Education Expenditure Comparability Study: Final Report, Volume I, Working Paper No.97-16, by Stephen M. Barro. Project Officer, Shelly Burns. Washington, D.C.: 1997; and U.S. Department of Education, National Center for Education Statistics. International Education Expenditure Comparability Study: Final Report, Volume II, Working Paper No.97-17, by Joel D. Sherman and Richard P. Phelps. Project Officer, Shelly Burns. Washington, D.C.: 1997.

[3] See Barro, Stephen M. Preliminary Findings from the Expenditure Comparability Study, SMB Economic Research, Inc., June, 1993.

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are in the construction and metal trades. Three-quarters of apprenticeships in the United States are concentrated in the unionized sector of commercial-industrial construction and in the maintenance departments of major manufacturers. Apprenticeship leads to formal, official credentials – a Certificate of Completion and journeyperson status. Little public money is spent on apprenticeships in the United States, especially in comparison with school-based training in public community colleges or postsecondary vocational-technical institutes.

Apprenticeship in Germany

Unlike the United States, apprenticeship is the predominant form of upper secondary education in Germany – enrolling between one-half and two-thirds of the youth population between the ages of 16 and 18. While apprenticeship programs in the United States are mostly confined to two industrial sectors, approximately 370 occupations in Germany have apprentices.

The objectives of apprenticeship programs in Germany are: a full professional qualification, thorough training in practical and technical skills and thorough theoretical instruction; an enhancement of general knowledge; the promotion of the student's personality and his or her sense of responsibility; a basis for modular technical and general education and for continuing education and training. The organizational frame of these programs involves: compulsory schooling in educational institutions of the public or private domain; a compulsory apprenticeship contract with the employer; supervision of the work-based component and inspection of the school-based component by public authorities and specially trained and certified authorities in companies. A typical apprenticeship in Germany lasts three years, mixing on-the-job training and school attendance, at a ratio of about 3 to 2. Employment in many apprenticeable occupations is effectively limited to those holding apprenticeship completion certificates.

The German states (*Länder*) pay for apprentices' schooling. Employers pay apprentices' wages and the costs of their on-the-job training. Apprentices' earnings are typically half those of what skilled workers earn in the same occupation. A large firm might spend as much as $10,000 to $15,000 per year on each apprentice. These firms employ full-time trainers and provide on-site classrooms, shops, and laboratories. Smaller firms often offer less thorough training. As the greatest proportion of the cost of apprenticeship is born by employers, private employers are, in effect, directly subsidizing the society's cost for educating its youth.[4]

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[4] S.F. Hamilton and R. Glover, "Economics of Apprenticeship," in T. Husén, T.N. Postlethwaite (eds.), **International Encyclopedia of Education**, Vol. I, Pergamon, 1994.

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